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# Development of Procedures for Deriving Training Objectives for Junior Officer Jobs

by

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## **FOREWORD**

The objective of the research described in this report was to develop a systematic method of preparing job-oriented training objectives for junior officers. The work was done under HumRRO Subtask SAMOFF III, Development of Procedures for Determining the Objectives for Junior Missile Officer Training Courses. Other publications of SAMOFF III are as follows: HumRRO Technical Report 65-10, A Model of Junior Officer Jobs for Use in Developing Task Inventories, November 1965; Prototype Manual, Manual of Procedures for Deriving Training Objectives for Junior Officers, November 1964; and HumRRO Technical Report 65-11, Performance Aids for Junior Officers, December 1965.

The research was conducted by HumRRO Division No. 5 (Air Defense) at Fort Bliss, Texas, and was originally undertaken by Mr. Hal Moon and Dr. Robert G. Smith, Jr. Dr. Edgar M. Haverland, Dr. Paul G. Whitmore, and Dr. James P. Rogers provided assistance and advice. Mr. Jerome A. Sweedler, CWO Marshal Pyland, Jr., and Mr. Don W. Walker obtained the mass of job information. The research was carried out under the guidance of Dr. Robert D. Baldwin, present Director of Research, and Dr. Robert G. Smith, Jr., former Director of Research. Military liaison and support were supplied by the U.S. Army Air Defense Human Research Unit. Military guidance and assistance were provided by Lt. Col. Leo M. Blanchett, Jr., present Unit Chief, and Col. David Cooper, former Unit Chief, and by Col. Arthur E. Solem, USA Ret., former Military Advisor. Many other associates also contributed to the accomplishment of the research.

Appreciation is expressed to the many officers of the U.S. Army Air Defense Command and of the U.S. Army Air Defense School who gave their time and cooperation to this project. Their interest, comments, and criticisms were most useful in the conduct of this work.

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The research was performed under Human Resources Research Office Task SAMOFF, which is a systematic analysis of training requirements and procedures for surface-to-air missile battery officers. HumRRO research is conducted under Army Contract DA 44-188-ARO-2 and Army Project No. 2J024701A712 01, Training, Motivation, and Leadership Research.

**MEREDITH P. CRAWFORD**  
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## **SUMMARY AND CONCLUSIONS**

### **Military Problem**

Managers of training in Army service schools, concerned with adequacy of student learning and economy in the formal instructional process, have need for timely identification of relevant training objectives. Making the training of junior officers responsive to the needs of the job is particularly critical because, to an increasing degree, such officers are being placed in responsible and complex roles that are nonroutine in nature.

The time available for formal training of junior officers is severely limited, so selection of the most essential training needs is mandatory. However, no specific procedure exists for use by all Army service schools for systematically and comprehensively deriving the relevant and essential student performance objectives for junior officer training.

Changes in systems, weaponry, and doctrine make it more difficult for school authorities to base their decisions on specific knowledge of the job as it currently exists. Emphasis on weaponry and equipment tends to eclipse training needs in other aspects of officer jobs. The scope and heterogeneity of officer job performance, as well as the dynamic and non-overt nature of many activities, pose special problems in analyzing training requirements.

### **Research Problem**

Research was needed to develop a systematic method of preparing job-oriented training objectives for junior officers. The procedures would be for use by Army service schools to determine appropriate objectives where none have been formulated, validate those that do exist, and update previously derived objectives. They should be capable of implementation by personnel assigned to a service school faculty or staff, without requiring special training as a job or training analyst.

The type of training objective regarded as of primary importance was the behavioral statement that clearly specifies what the student should be able to do upon completion of instruction.

### **Research Approach**

As the SAMOFF III experimental procedures were developed, they were tried out on one sample officer job (Nike Hercules Fire Control Platoon Leader). Experience in this application of a procedure provided the basis for (1) modifying the procedure, as desirable, for use in service schools and (2) developing the ensuing procedures in the overall process.

The research began with the development of procedures for preparing a task inventory, or list of all tasks for a job (Phase A). This inventory provides a comprehensive basis for subsequent selection of material for training purposes. This phase, which involved developing a model of junior officer behavior to provide a conceptual basis for subsequent work, has been described in a separate report (HumRRO Technical Report 65-10).

Selection of those tasks on which some formal training is essential constituted Phase B. The information in the task inventory was used as the basis for a questionnaire to be administered to job incumbents and their immediate commanders, to obtain specific information concerning the frequency, importance, and performance deficiencies observed for each task. The responses in the trial administration represented nearly all occurrences of a particular junior officer job within one major command. The information obtained was then used to select the activities that most

required formal school training. The rules developed for making these selections were based on a training policy that the school should prepare the trainee for effective performance of the important tasks of his new job.

The specific aspects of the selected tasks to be emphasized in formal training were identified in Phase C, and detailed descriptions of the selected activities were prepared in Phase D. By this method the number of tasks requiring detailed description was progressively reduced from the initial complete task inventory to include only those tasks warranting formal training on some aspect of skill or knowledge.

The techniques employed in the procedures included interviews with field personnel, mailed questionnaires, reviews of pertinent directives and publications, and visits to field units. While all of these methods have been used on occasion by service schools to improve the quality of their training programs, the SAMOFF III procedures structured these efforts to standardize their use for systematically determining the learning essentials of most value to the trainees.

## **Results**

Application of the experimental procedures to the sample junior officer job resulted in a task inventory of 816 job tasks, consolidated into 452 items for listing in the Job Activities Questionnaire. From this number, 101 job activities, or 22%, were selected as needing some formal instruction. Identification of knowledges and skills to be taught for these selected activities resulted in statements of 160 training objectives for this one job. However, only 46 of these identified objectives necessitated the student acquiring an ability to actually perform a job task. Thus, only 46 detailed procedural task descriptions had to be prepared in Phase D.

The procedures that were developed are described in a prototype manual prepared for use by service school personnel. It contains detailed instructions for each phase of the SAMOFF III process, examples from the research application of the procedures to the sample officer job, and other aids to enhance the feasibility of use of the process by military personnel assigned to relevant duties at service schools.

## **Conclusions and Implications**

(1) The SAMOFF III method provides complete procedures by which it is feasible for service school personnel to derive behavioral statements of relevant and essential training objectives for junior officers.

(a) The mailed administration of the questionnaire based on the task inventory was an effective method for rapidly obtaining useful information and judgments on each job task from officers immediately and directly concerned with current operations. The procedures included a clerical routine for rapidly summarizing distribution of responses to each question. Personally administered questionnaires, while permitting deeper discussion and analysis of issues, required an excessive amount of time and travel by analysts.

(b) The research questionnaire has been modified to provide only the most useful types of information and to reduce the time (about four hours for the current version) needed for each respondent to complete his portion of the form.

(c) The selection rules make it possible to use the questionnaire information in a systematic fashion to identify activities that should be included in school training. These rules can be applied rapidly by a clerical routine. Their use resulted in selection of tasks in nearly all job areas of responsibility, although the majority dealt with tactical equipment operation and maintenance management. In the sample job, the rules also brought about selection of important wartime tasks for training, even though such tasks are infrequently performed in normal peacetime operations.

(d) Aspects of selected tasks that most required training emphasis were effectively identified in Phase C by means of a short mailed questionnaire. The combination of a selected task statement and the aspect requiring training emphasis yielded a brief statement of a training objective, providing an early general indication of each learning requirement prior to the completion of the more detailed descriptions.

(2) A comparison of the existing course of instruction with the job activities (22%) isolated as needing some formal instruction indicated that most of these selected tasks were already considered sufficiently important to be included in training.

(3) Not only are clearly specified behavioral objectives obtained by the process, but the sequence of operations provides useful general information on training needs early in the process, after a minimum of analyst effort.

(4) These general statements on objectives and needs can be periodically redetermined merely by readministration of the questionnaires, thus permitting a rapid review of the currency and completeness of established training objectives.

(5) Elements of the SAMOFF III procedures for developing training objectives could be readily adapted for use in forecasting training objectives for officer jobs that will be created by the development of new weapon systems. The method provides a structure into which information from various sources could be fitted as it becomes available.

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**Development of Procedures  
for Deriving Training Objectives  
for Junior Officer Jobs**

## Chapter I

# THE PLANNING OF OBJECTIVES FOR ARMY TRAINING

### NATURE OF INSTRUCTIONAL OBJECTIVES

Training programs, civilian or military, are intended to modify a student's skills and knowledge in accordance with specific instructional goals. In developing training programs, the problem of identifying what goals should be sought has two major aspects: the selection of appropriate instructional objectives from the broad range of possibilities, and the form in which the objectives should be stated to be of greatest utility for students, instructors, and training managers.

While the idea of having goals for instruction is certainly not new, in recent years interest in clearly specifying and justifying instructional goals has increased sharply. Instructional institutions have been critically re-examining instructional content and the reasons for teaching it. In particular, more attention is being given to the form in which objectives are stated. This concern has been spurred, particularly in the military training context, by pressures to improve the quality of formal schooling and concurrent pressures toward economy and efficiency in instruction.

#### Form of Objectives

In 1950 Tyler (1) discussed three ways in which objectives typically were being stated and the inadequacies of each approach for a systematic and intelligent analysis of curriculum and instruction:

Objectives are sometimes stated as things which the instructor is to do; as for example, to present the theory of evolution [or] to demonstrate the nature of inductive proof. . . . The real purpose of education is not to have the instructor perform certain activities but to bring about significant changes in the students' patterns of behavior. . . . The difficulty of an objective stated in the form of activities to be carried on by the teacher lies in the fact that there is no way of judging whether these activities should really be carried on. They are not the ultimate purposes of the educational program and are not, therefore, really the objectives. . . .

A second form in which objectives are often stated is in listing topics, concepts, generalizations, or other elements of content that are to be dealt with in the course. . . . Objectives stated [in this form] do indicate the areas of content to be dealt with by the students but they are not satisfactory objectives since they do not specify what the students are expected to do with these elements. In the case of generalizations, for example, is it expected that the student is to memorize [them], or to be able to apply them to concrete illustrations in his daily life . . . or is there some other kind of use to which the student is expected to put these generalizations? In the case of a list of topics the desired changes in students are still more uncertain. . . .

A third way in which objectives are sometimes stated is in the form of generalized patterns of behavior which fail to indicate more specifically the area of life or the content to which the behavior applies. For example, one may find objectives stated as "To Develop Critical Thinking." . . . Objectives stated in this form do indicate that education is expected to bring about some changes in the students and they also indicate in general the kinds of changes with which the educational program is expected to deal. However, from what we know about transfer of training it is very unlikely that efforts to aim at objectives so highly generalized as this will be fruitful. . . .<sup>1</sup>

<sup>1</sup>Permission to use the above copyrighted material (1, pp. 28-30) has been granted by the University of Chicago Press.

Tyler contended that the most useful form for stating objectives was to express them in terms of the behavior to be developed in the student and the conditions under which this behavior was to occur. More recently the interest in programed instruction has increased the emphasis on stating objectives in behavioral terms.

As presented by Mager (2), behavioral objectives must satisfy three conditions in order to achieve a clear and complete statement of instructional intent. They must:

- (1) Describe, explicitly, what a student must be able to do upon completion of instruction, clearly identifying the kind of behavior that he should be capable of exhibiting.
- (2) State the important conditions under which the student demonstrates his mastery of the objective, describing elements of the situation fully enough so that the desired behavior is clearly distinguishable from other possible behaviors.
- (3) Specify the standards of performance a student must meet in demonstrating his attainment of the objective, establishing the minimum level acceptable.

If these three conditions are fulfilled, communication should be clear enough that all persons involved in the instructional process can fully understand the intent of the objective.

Such behavioral statements of objectives serve a variety of purposes in achieving more effective instruction. Among the important benefits they may have for instructors, instructional managers, test constructors, curriculum planners, and the students themselves are the following:

- (1) The selection of appropriate learning experiences for inclusion in the instructional program is improved. The focus is on what the student is to learn rather than on what the instructor is to teach.
- (2) Lesson plans can be prepared to directly seek the attainment of specific objectives, minimizing the possibility of wasteful digressions into irrelevant subject matter. (This does not prohibit instructional content intended primarily to enhance student interest and motivation.)
- (3) Textbooks, teaching aids, and other instructional materials can be judged for relevance to the program goals.
- (4) Reality and performance become emphasized in the instruction, stimulating interest and learning.
- (5) Students can be provided with specific learning goals as they progress through the course, so that they know just what is expected of them as a result of their exposure to the instruction.
- (6) Each student's attainment of instructional goals can be evaluated.
- (7) Instructors can obtain valid and objective feedback on how effectively they are teaching.
- (8) Effectiveness of instruction can be objectively measured by supervisors, enabling them to detect and correct inadequacies earlier.
- (9) Consistency in instructional goals can be attained across all instructors.
- (10) Student achievement can be evaluated directly in terms of the instructional goals, assuring a valid relationship between what is taught and what is tested.
- (11) Needs may be identified for revising instructional programs and teaching methods to help students attain the objectives more readily.

### Selection of Objectives

For almost any instructional program there are likely to be many more topics that might be included than there is time to treat all of them adequately. In some instances time limitations necessitate reducing the length of the program to a minimum, teaching only the essential matters and disregarding things that are only "nice to know." Constraints of this nature are particularly critical to devising training given by Army service schools. In formal Army training, there is always a need to minimize training time in order to get the men into operational job situations as soon as possible. The proper selection of the objectives to be included in the training program is therefore a major factor in designing instruction.

### DEVELOPMENT AND MODIFICATION OF MILITARY TRAINING COURSES

In Army service schools, adequacy of student learning and economy in the formal instructional process are primary concerns. For management of training, proper and timely identification and selection of objectives have considerable value.

Each of the various schools tends to develop its courses of instruction independently, although all are controlled to some extent by training policies and guidelines established by the Department of the Army and by the U.S. Army Continental Army Command (USCONARC). For curricular development and modification, seven basic principles were established by directive (3), to be followed to obtain desired levels of military proficiency from the training system. Not unlike those advocated by other training authorities (4, 5), the USCONARC principles required a training course to be based upon specifications of training objectives, which in turn were to be derived from job performance requirements.

U.S. Army schools each follow these concepts by means of a wide variety of activities, including the use of questionnaires and surveys, interviews, conferences, visits to field units, analyses of course and student evaluations, task and skill analyses, and various reports and comments. Participating in one or more of these activities are in-course students, course graduates, instructors and faculty, subject matter experts, field commands, job incumbents and their immediate commanders or supervisors, school management officials, and equipment or materiel developers.

Probably the most common technique for establishing the topical content of a particular course is a conference of school management officials and selected faculty personnel. However, for new equipment systems, task and skill analyses of the operator and maintenance tasks, prepared by the contractors, are being used to an increasing extent.

The specific approaches used by each school have evolved to meet the needs of local situations. Their development has been a function of the stability of training objectives and job systems, the training philosophy of the school, the nature of the subject matter, information from commanders of units to which school graduates are sent, and the manner in which course programs and objectives have been specified.

With the upsurge of interest in behaviorally stated objectives, many Army schools are converting the objectives (stated or implied) of their present courses to the terminology of student performance objectives. Reviews by instructor and other school personnel are commonly used to judge the relevance and essentialness of these objectives. Instructional programs and student examinations are gradually changing as a result of this emphasis upon student performance.

An established course typically continues to undergo modification of its coverage and emphases in response to new information, suggestions, and analyses of course effectiveness. Responsiveness may, however, be based on such tenuous features as incidental, isolated bits of information, conditions peculiar to only a few operational situations, matters of immediate but fleeting importance, or varying pressures from field commands having different interests. When new content or job procedures are introduced in a course, the tendency often is to treat the new material in the manner in which related material was handled in the past, even though such an approach may not be appropriate to the new material. Over time, it is possible for response to happenstance factors to distort a course so drastically that the training objectives are not commensurate with the critical job requirements.

Each school is responsible for evaluating each suggested change in a course and for keeping that course responsive to the most relevant and essential requirements for training. To accomplish this, training managers need accurate and timely information representative of the job situations school graduates will encounter.

Despite the variety of approaches used, training management may often find it does not have available all of the information needed to make and support decisions. Even in long-standing courses with relatively stable content, if the objectives have not been specified in terms of actual job behavior requirements there is a possibility that instruction has digressed into areas that are irrelevant and nonessential. This is usually evidenced by a concentration on theory, overall system operation, principles, and generalizations, without concurrent demonstration of how such information is specifically used by job incumbents.

#### TRAINING OBJECTIVES FOR JUNIOR OFFICERS

The particular concern in this study was the determination of training objectives for junior officer jobs. Making their training responsive to the needs of the job is especially critical because of the increasingly responsible and complex roles that junior officers have in today's Army. Limitations in the amount of time that can be allotted to training junior officers underscore the need for selecting the most essential elements for training.

The rapidity and frequency of changes in systems, weaponry, and doctrine hamper the ability of school authorities to base curriculum decisions on specific knowledge of a job as it currently exists. Courses saturated with traditional content may be including material that is no longer essential, but identifying it is difficult and justifying content revisions is complicated. Differing job titles based on echelon of service or on system assignment may mask training requirements in common. Conversely, inclusion of many job assignments within one Military Occupational Specialty (MOS) description may mask dissimilar instructional goals. Emphasis on weaponry and equipment also tends to eclipse needs for training in other aspects of officer jobs.

The process of determining training objectives for junior officers encounters two special problems that are not as crucial for operator and technician jobs:

- (1) Distinction Between Training and Education. The role of the service schools in providing junior officers with job performance training is not clearly defined. There has been a tendency for the concept of the "generalist" officer, in which all career officers are expected to be able to perform competently in a wide variety of assignments, to be applied to all levels of officer training. Application of this concept places emphasis on educational objectives

rather than on training objectives. However, the needs of junior officers (many of whom are not, and will not become, career officers) are not met by instruction that concentrates on educational objectives. With few exceptions, they have predetermined job assignments in which specific tasks require specialized school training.

A Department of the Army committee that studied this problem of educating versus training officers concluded that "the school system should initially emphasize the training of the branch specialist for immediate duty, and should progressively broaden each field until, at the highest level, emphasis is placed upon educating the generalist for duty in an indefinite time frame" (6, p. 105). More specifically, the committee concluded that "the initial branch training of newly commissioned officers (orientation course) should be limited to coverage of those subjects essential to the officer's first duty assignment." Even for branch career courses for officers with three to eight years' service, the stress remains on training, but with some broadening into military education.

This same philosophy for sequential progression of officer instruction from training to education was implied in a directive to Army service schools (3), in which it was stated that officers should specialize during the early years of their careers to develop the technical competence required as a sound foundation for further career development.

Apparently, however, the labels of "orientation course" and "career course" used to designate the first two levels of instruction for officers may be misleading to curriculum designers. An examination of existing junior officer courses indicates that the instructional emphasis is on a broad-brush orientation to a system or on branch-wide career development, with less attention given to developing specific skills needed by the students in foreseen job assignments. Graduates of such courses may lack important skills needed to perform the job.

(2) Breadth and Variability of Junior Officer Jobs. Typically, junior officer jobs are characterized by a high proportion of variable, nonroutine, and mental activities. Actions must be responsive to changing conditions, events, and circumstances. Areas for action include such diverse activities as tactical leadership in combat operations, management and administration of small military installations or offices, control of disruptive influences affecting unit personnel, and evaluation of equipment or system readiness.

The breadth and heterogeneity of job performance requirements, and the dynamic and mental nature of many activities, pose a special problem for analyzing the training requirements of officer jobs. The task and skill analysis techniques that are available were developed for use on equipment operator and maintenance jobs, in which the tasks are highly proceduralized and observable.

## Chapter 2

### RESEARCH RATIONALE AND APPROACH

#### RESEARCH PROBLEM

The purpose of this study, carried out as part of HumRRO Subtask SAMOFF III, was to develop explicit and standard procedures for use by Army service schools in systematically deriving behavioral statements of training objectives for junior officer jobs.

It was desired that the procedures have the following characteristics:

- (1) Be capable of implementation by personnel assigned to a service school faculty or staff, without requiring special training as a job or training analyst.
- (2) Be applicable to the diverse spectrum of responsibilities and actions of which junior officer jobs are comprised.
- (3) Produce training objectives that give meaningful and useful guidance for planning instruction and preparing curriculum and lesson plans.
- (4) Be useful for validating objectives that already exist, and for periodically updating objectives.
- (5) Exhibit economy and speed in application, compatible with a demand for rigor and completeness.
- (6) Yield statements of training objectives that clearly communicate the intended goals of instruction to other personnel involved in the instructional program.

#### RESEARCH METHOD

The approach taken in this research was to use, insofar as possible, the techniques that had previously been effective for the analysis of equipment-oriented jobs, modifying these techniques as necessary to fit the characteristics of officer jobs. The initial version of the procedures was tried out on one junior officer job, and the results of the trial were used to arrive at a revised set of procedures.<sup>1</sup> Many of the specific procedures were directly adapted from proven techniques for describing tasks and for gathering job data and judgments by means of questionnaires.

The job that was used for experimental application in developing the procedures was that of the Nike Hercules Fire Control Platoon Leader, an important and prevalent junior officer assignment in Air Defense. The scope of this job covers a wide variety of responsibilities and actions, many of which are representative of those required in other junior officer assignments throughout the Army.

<sup>1</sup>This method results in conclusions that require verification in additional situations; however, the procedures have the merit of being applicable to at least one existing and important officer job, rather than being purely conjectural.



More than 200 air defense battery officers provided information and judgments on job performance and training requirements by answering mailed questionnaires. Additionally, a number of air defense personnel were interviewed extensively, and 15 Nike battery installations were visited. Relevant official directives, manuals, and training literature also supplied information for task descriptions.

#### ADAPTATION OF EQUIPMENT TASK APPROACH FOR OFFICER JOBS

The traditional approach to task and skills analysis has been developed to determine, systematically and comprehensively, the performance and training requirements of equipment operator and maintenance jobs (4, 7, 8, 9, 10). Basically, this approach involves three sequential activities:

- (1) Identification of all tasks in which operators or maintenance personnel directly interact with the equipment.
- (2) Specification, through a cue-response analysis, of the individual skills and knowledges essential in proper performance of each task.
- (3) Selection and organization of those skills and knowledges that require training.

While this approach to training for equipment-oriented jobs has been used effectively in analyzing the personnel requirements for complex weapon systems, certain features were not suited for use by Army service schools on officer jobs. Problem areas include the following: (a) Many portions of the techniques require analysts having special skills in job analysis and psychology; attention is concentrated on the procedural or skill aspects of task performance, with requirements for component knowledges and skills being identifiable only through psychological analysis of procedural actions. (b) The approach covers only tasks directly involving equipment, a relatively small proportion of the work activities for many officer jobs. (c) All tasks are described in detail before there is any selection for training purposes, an impractical approach to officer jobs because of the great diversity of tasks to be described.

It was evident that applying the traditional cue-response analysis to each task performed by an officer would not be feasible or sufficient. The usual approach to task and skills analysis was therefore modified in this research. As revised, the SAMOFF III procedures sequentially select the aspects of a job and its tasks that warrant more detailed study. After starting with an overall look at all job responsibilities, the scope of interest is progressively narrowed and effort is directed into more and more exhaustive analysis of explicit student performance requirements.

The modified approach for use with officer jobs consists of the following four sequential phases:

- Phase A. Identification of all tasks performed by officers in the job assignment, to provide a comprehensive foundation for later selection processes to establish training content. This phase of the SAMOFF III procedures has been described in a separate report, A Model of Junior Officer Jobs for Use in Developing Task Inventories (11).
- Phase B. Selection of those tasks for which some formal training is essential.
- Phase C. Identification, in each task selected, of the specific aspects that should be emphasized in the school training.
- Phase D. Specification of the knowledges and skills identified as the components on which training is needed on each selected task.

An outline of these sequential phases and their major subprocedures is presented in Figure 1. This figure will serve as an overview of the material to be presented in the following chapters, summarizing what the analysts do, where they get their information, and what product is obtained at each major step. Included is an estimate of the time that school analysts would require to accomplish each step; work on some steps would be initiated before the previous step was completed.

### Sequential Procedures for Deriving Training Objectives

Phase	Work of Analysts	Information Source	Product	Estimated Time
<b>A</b> <i>Identifying all tasks</i>	List all tasks of the job.	Interviews Publications	Initial Job Description (IJD) (task inventory)	1 month
	Modify task statements.	School interests IJD	List of Activities booklet	1 week
<b>B</b> <i>Selecting tasks that require some training</i>	Print & mail Job Activity Questionnaire (JAQ), with List of Activities.	Job incumbents Commanders	Responses to questions on each listed task	2 months
	Summarize questionnaire data.	JAQ responses	Summary data for each task, job aid indications	1 week
	Apply selection rules.	Summary JAQ data	Tasks selected for training	2 days
<b>C</b> <i>Identifying task aspects needing emphasis in training</i>	Print & mail Training Emphasis Questionnaire (TEQ), with list of selected tasks.	Job incumbents Commanders	Responses to Training Emphasis question on selected tasks	6 weeks
	Summarize questionnaire data.	TEQ responses	Identification of training aspects (learning tasks)	3 days
	Prepare general statements of training objectives.	Task selections Training aspects	Report of general objectives	1 week
<b>D</b> <i>Specifying the knowledges and skills involved</i>	Describe each training aspect.	Interviews Publications	Detailed Activity Descriptions (DADs)	2-6 months
	Prepare complete statements of training objectives.	All procedure products	Report of complete objectives	2 weeks

Note: Time estimates are for accomplishment after previous step is completed.

Figure 1

### Chapter 3

## OBTAINING INFORMATION AND JUDGMENTS AS A BASIS FOR SELECTING TASKS FOR TRAINING

Phase A of the SAMOFF III process (described in an earlier report, 11), resulted in development of a task inventory—a listing of all the relevant tasks of an officer's job. As a next step, a procedure was needed for identifying, from the inventory, the tasks most requiring formal school training to meet current job needs. Obtaining information toward this end is the initial step in the selection phase (Phase B).

### INFORMATION SOURCES

Where tasks are concerned only with equipment operation and maintenance, job-relevant information can be derived from analyses of equipment functioning or from judgments of experts. However, for jobs typically performed by junior officers these sources may often be inadequate or unavailable. In addition, analyses of equipment functions lend little insight into the specific managerial performance requirements, and represent only a portion of the total officer job.

The flexible and dynamic nature of supervisory and management performance makes it difficult to obtain exact descriptions of all aspects of a job in all its various occurrences throughout one or more major commands. Often used as job experts are officers assigned to a service school staff who previously had served in the job position or had exercised field command over such positions. However, the job changes as time passes, and individuals with direct job knowledge tend to lose their expertness about current requirements as time away from the actual job increases. Relative task emphases and areas of performance problems would be particularly susceptible to change with time, and such changes would be extremely difficult for a school staff to observe.

It was assumed that the most knowledgeable individuals, as a group, would be officers having current experience with the job and adapted to its needs. Therefore, officers serving in the job position, and their immediate commanders, were selected as the primary source of information. (While higher commanders would have useful knowledge, they would generally not be available in sufficient numbers to provide information about job tasks). It was felt that officers directly concerned with the job are familiar with all the pressures currently placed on it and, as a group, they represent all instances in which the job occurs; although they may not be in a position to foresee all future needs, their group judgments ought to provide a reasonably accurate picture of current performance requirements. Inclusion of immediate commanding officers as information sources was expected to provide perspective on command interests and intents, and to permit a comparison between actual and desired task performances. It was felt that the adequacy of information and judgments provided by officer job incumbents and their commanders would be enhanced by the immediacy of their needs for effective unit performance and by their responsiveness to changing directives and job conditions.

## MEANS OF GATHERING INFORMATION

### Using Task Questionnaires

The mailed-out questionnaire was selected as the principal data-gathering technique because such questionnaires are easy to administer, permit wide respondent coverage, and are not subject to interviewer biases that might influence the survey results. The resultant data from many knowledgeable persons provide specific information, representative of a wide range of job situations, on which to base selection of tasks for training.

Task questionnaires have been used extensively to obtain reliable information and judgments from field personnel for many military job assignments (12, 13). They provide a fast, economical means for gathering data about specific job tasks from a wide range of locations—a feature that is particularly useful for jobs in which opinions may differ as to the most essential training needs and the actual performance requirements.

The range of information and judgments that can be obtained by such questionnaires has been proven to be quite extensive. For example, recent studies<sup>4</sup> have effectively acquired responses from field personnel for specific job tasks on such diverse matters as frequency of task performance, task difficulty, task importance, proportion or amount of time spent, required proficiency level, training priority level, extent to which task is part of the job, useful type of training for task, and type of assistance obtained for task performance.

In most instances answer categories have been provided, allowing responses to be made in a checklist fashion. This format enables respondents to answer the questionnaire rapidly and permits automatic data processing of individual responses. Basic to this technique for gathering information is the availability of a list of specific tasks about which information is desired, thus avoiding the need for respondents to recall all tasks of the job. Such a list—a task inventory—should cover all aspects of a job.

### Obtaining Data for Use in Task Selection

As a basis for selecting tasks to be included in training, the following factors need to be considered:

- (1) How often each task is performed by a job incumbent.
- (2) How often each task should be performed.
- (3) Proportion of job incumbents concerned with each task.
- (4) Importance of each task to effective unit operation.
- (5) Existence of a discrepancy between what is done and what should be done by job incumbents.
- (6) How soon task competence is expected after job assignment.
- (7) Tasks for which all essential learning can be, and is being, adequately acquired on the job in the time available.
- (8) Tasks for which all essential learning has occurred prior to school attendance.
- (9) Tasks on which job incumbents are having difficulty in acquiring competence on the job.
- (10) Tasks on which training difficulties are being experienced.
- (11) Tasks for which procedures could be improved through school training efforts.

<sup>4</sup>Personal communication, Dr. Joseph E. Morsh, 3 March 1964.

To yield current data on these matters, a series of eight questions was designed to be answered for each task by individuals who are knowledgeable about the job as it currently exists. The questions, which have been designated as the Job Activity Questionnaire, cover the following topics: Actual Frequency of Performance, Desired Frequency of Performance, Activity Importance, Learning Location, Time to Qualify, Possible to Improve Procedures, Poorly Performed Activity, and Time to First Performance. (The full questions and the response categories are presented in Appendix A.<sup>1</sup>)

Not all of the questions were to be asked of all respondents. For some of the questions the commander would be the more knowledgeable informant, for others the job incumbent would be preferred. Also, so much time would be needed to answer even a single question for each task in an inventory that some plan had to be devised to limit the number of questions asked of a person or to ask questions about fewer tasks.

Both of these problems were taken into account in planning the procedures. The eight questions were divided among commanders and job incumbents, as described in the section on trial application. And, as the final step in the listing of job tasks in Phase A, the total list of tasks included in the task inventory was shortened by consolidating related tasks into slightly more general statements. This consolidation, when applied to the Air Defense job (as described in the earlier SAMOFF III report, 11) reduced the number of statements in the task inventory from 816 to 452. These tasks were divided among 12 job areas of responsibility.

#### Eliciting New Task Information

There is always a need to keep a task inventory up to date. While the task inventory initially prepared for use with the Job Activity Questionnaire would contain most of the job tasks, opportunity should not be lost to add new tasks that may have developed, or any tasks that might have been overlooked in the original list as a result of inadequate job sampling.

One way to accomplish this is to ask questionnaire respondents to write in any tasks not listed. However, Fruchter, Morin, and Archer (14) found that when task statements were intentionally omitted from an open-ended inventory, large samples of enlisted job incumbents were necessary to ensure that the omitted tasks would be re-listed by the subjects. While many tasks may be written in on questionnaires, seldom do many persons write in the same task. Thus, write-ins are likely to serve only as clues to possible tasks, and need to be investigated further before they are included in future inventories of job tasks.

In the questionnaire used in this research, new tasks were solicited only for equipment and system checks performed by the officer, on the assumption that this is the area most subject to change of tasks. Respondents were not asked to provide frequency, importance, or other judgments for their write-in tasks.

<sup>1</sup>On the frequency and importance questions, the original response categories permitted respondents to make a "formal-informal" distinction in task performance. While most respondents used the distinction to some degree, there was so little agreement as to tasks on which the distinction pertained that this element was dropped from the analysis and is not reflected in the response categories shown in Appendix A.

# **TRIAL APPLICATION OF JOB ACTIVITY QUESTIONNAIRE (JAQ) TO AN AIR DEFENSE JOB**

The questions in the experimental questionnaire were pretested on several officers at the Air Defense School and on battery officers at three Air Defense fire units. They were then administered to most active Army job incumbents and immediate commanders in one major command during January and February 1962.

After coordination with the command headquarters, packets of questionnaires and letters of instruction were sent to each battalion headquarters for distribution to battery officers. Action officers were appointed by each battalion. Respondents were requested to complete the questionnaires within two weeks and to personally mail them back to the research unit.

Groups of job incumbents and commanders were divided in random halves, with questions assigned as shown in Figure 2. Thus, both incumbents and

**Assignment of Questions in Experimental Job Activity Questionnaire**

Question	Job Incumbents		Immediate Commanders	
	One Half	Other Half	One Half	Other Half
Actual Frequency of Performance	1	1		
Desired Frequency of Performance				1
Activity Importance	2			2
Learning Location	3			4
Time to Qualify			1	
Possible to Improve Procedures			3	
Poorly Performed Activity				3
Time to First Performance		3		
(Training Emphasis—Included only in experimental version of JAQ)		2	2	

Note: Numbers indicate order in which respondent answered the questions.

**Figure 2**

commanders answered the Activity Importance and Learning Location questions. Only job incumbents responded to Actual Frequency of Performance and Time to First Performance questions; only commanders answered questions dealing with Desired Frequency of Performance, Time to Qualify, Possible to Improve Procedures, and Poorly Performed Activity.

One additional question was included in the experimental administration of the questionnaire, but would normally be administered separately at a later stage. This question, labeled Training Emphasis, pertained to a subsequent phase of the procedures. It was answered by half of the incumbents and half of the commanders. Discussion of this question is reserved for a later section of the report.

The respondent was to answer each question separately for each of the listed tasks before proceeding to the next question. This procedure was followed to assure that the respondent would maintain the same orientation for all tasks on a particular question. Separate answer sheets were provided for each question, with responses generally recorded by checking or circling a coded symbol for response categories. The task inventory consisted of a separate booklet titled List of Activities, incorporating the 452 job activity statements developed in Phase A.

The order in which questions were answered (see Fig. 2) was such that the respondent started with a relatively simple, objective question, then proceeded to more judgmental questions. This order permitted the respondent to become somewhat familiarized with the task statements before he attempts to make judgments. Questions answered by commanders on procedure improvement and activity performance would require comparatively little response time once the officer was familiar with the task statements.

To obtain additional information with regard to the experimental questionnaire, researchers administered it personally to battery officers at 12 sites in four battalions. This administration was conducted to determine whether there were any important response differences that might be attributable to either type of questionnaire administration, and to provide first-hand information on how the respondents interpreted instructions and whether they demonstrated any particular tendencies in answering, such as response sets. The data from this administration were not combined with the responses from the main experiment with mailed questionnaires, but were analyzed for comparative purposes.

For this personal administration, two researchers visited each of the selected batteries, which were representative of the total command geographically and with regard to radar and missile systems. In addition to administering the questionnaire, the researchers interviewed battery officers for task information to be used later in preparing Detailed Activity Descriptions (DADs).

Each questionnaire respondent completed a background information sheet briefly describing his job experience, schooling, and assignment. Respondents were also asked, after completing the questionnaire, to indicate how long it took them to answer each question, and to comment upon the adequacy of the activity statements and upon the questionnaire itself. Data on geographical location and specific weapon systems for each respondent were separately obtained from the command headquarters.

Results of the experimental administration of the Job Activity Questionnaire were assessed from two viewpoints. First, the feasibility of using the mailed questionnaire approach was evaluated as evidenced by rate of returns, administration time, comments of respondents, usage of question response categories, and various comparisons between groups to which the questionnaire

was administered. Second, the adequacy of the obtained information for use in selecting tasks for training was assessed. This involved such factors as the ease of data tabulation, computation of summary values for groups, and sensitivity of the responses in differentiating job performance requirements among the many tasks. These analyses are discussed in the next section. (Data are for the mailed questionnaire respondents unless otherwise noted.)

## RESULTS OF TRIAL APPLICATION OF JOB ACTIVITY QUESTIONNAIRE

### The Questionnaire Administration

**Returns.** Within six weeks of mailing, questionnaires were completed and returned by 92% of the commanders and 86% of the job incumbents. Because of this very good return rate, no attempt was made to follow-up on those who did not answer. The number of usable questionnaires returned was 50 or more in each of the four questionnaire groupings (Fig. 2). Only three of the returned questionnaires were judged unsuitable, because of response inadequacies.<sup>1</sup>

**Administration Time.** The median times for completing each question for the 452 tasks are given in Table 1. The median group time to complete the assigned questionnaires ranged from about 6 hours for the lowest group to more than 8 hours for the highest. In all cases the first question answered by each group required the most time, between 2.5 and 3 hours. Individually administered questionnaires averaged about 20% less time to complete than did the mailed questionnaires.

Table 1  
Time Required to Complete Each Question for 452 Tasks

Question	Median Hours to Answer Question	
	Mail Administration <sup>a</sup>	Personal Administration <sup>b</sup>
Actual Frequency of Performance	2.5	2.4
Desired Frequency of Performance	3.0	2.3
Activity Importance (Incumbents)	1.8	1.5
Activity Importance (Commanders)	2.2	1.9
Learning Location (Incumbents)	1.8	.8
Learning Location (Commanders)	1.8	1.4
Time to Qualify	2.9	2.4
Possible to Improve Procedures	1.5	.7
Poorly Performed Activity	1.4	.8
Time to First Performance	2.0	1.1
Training Emphasis (Incumbents)	3.2	2.2
Training Emphasis (Commanders)	3.1	3.0

<sup>a</sup>Times reported by respondent.

<sup>b</sup>Times recorded by researcher.

<sup>1</sup>The rate of usable questionnaires was about the same for the personally administered sample, the questionnaire could not be administered properly in one battery because of site operations during the time of the visit.



Comments of Respondents. In the section designed to elicit comments, 53% of the respondents made entries of varying nature. Comments about the lengthy time required to answer the questions were made by 25% of the officers, with 5% expressing considerable concern on this point. Persons concerned with the time requirements generally took no longer to complete the questionnaire than did the others. Criticisms on length were equally distributed across all questionnaire groups, as well as across levels of respondents' job experience.

Since the Training Emphasis question normally would not be in the Job Activity Questionnaire, the amount of time required in subsequent administrations would be, on the average, 1 ½ hours less than in the experimental administration. (Other actions subsequently taken to reduce the questionnaire length will be discussed later.)

### Usage of Response Categories

For each of the questions, the response categories provided seemed to be used with reasonable frequency. Tabulations in Appendix A show the percentage of responses in each category for each question. Comparison of incumbent and commander groups indicated that they were quite comparable in their category usage. The relative use of various categories determined how a group's response on each task of the job was summarized.

Examination of answer sheets showed that all but two respondents had used a variety of categories for each question. Thus, less than 1% of the answer sheets were discarded on the basis that the respondent made no discriminations between any tasks, merely checking off a single response category for all listed activities.

From the personal administration of the questionnaires, the researchers learned that commanders tended to use the frequency category of "once a day" to represent a response of "perform as necessary" or "as the occasion arises." No such nebulous response category had been provided, with the deliberate intention of forcing responses into a numerical framework that could be subject to quantitative comparisons. However, the habitual use of the category for the less quantitative judgment by many officers resulted in some over-use of the "once a day" frequency category.

Both the mailed and the researcher administrations resulted in quite similar category usage on questions dealing with frequency and time, but there tended to be differences on the questions calling for more subjective judgment. For comparison, the percentages of category usage for these questions on the researcher administration are included in Appendix A. There is some indication that the researchers may have inadvertently exercised some influence over these judgments to produce a more equal distribution of responses across all categories. However, the comparison is not clear, because of the small number of responses in the non-mailed administration; also, most incumbents in this administration were below the average in length of job experience.

### Summary Values

Computation. Summary values that would represent "average" responses for each task on each question were determined from tabulations of responses. While standard methods of data analysis (e.g., means and medians) were used in the study, methods of computation requiring only the simplest clerical skills were explored so that procedures would not be needlessly limited by unavailability of Automatic Data Processing (ADP) or other statistical analysis

facilities. In general, it was found that simple clerical procedures produced the same selections as more refined methods. Where sophisticated facilities—ADP or other methods—are available, it may be economical to use refined statistical indices.

For frequency and time questions, the category checked most frequently by respondents—the modal response—was found to yield about the same task selections as did more refined measures of central tendency, since refined values were not needed in selecting tasks. For instance, the following distribution of responses,

	Hypothetical scale values					
	1	2	3	4	5	6
Responses	1	0	2	13	11	3

was as usefully summarized by the modal value of 4 as by the median or mean value of 4.4 when selection of a task was based on any value greater than 3. Therefore, modes were used as the basis of summary values for the frequency and time questions. When adjacent categories were tied, they were used as a joint modal value. A modal category had to represent at least 20% of all responses to be acceptable as a summary value.

For the other questions, it was found that summary values determined by inspection of a frequency distribution of responses for a task were as useful as more precise measures. Summary values were based as follows:

(1) Importance—one of six summary designations (e.g., High, Moderate), depending on the pattern of responses for a task.

(2) Learning Location—the modal response on a task, plus any responses used nearly as frequently. Each summary value had to represent at least 20% of the respondents.

(3) Improvement and Performance—(a) a value based on the number of positive responses to the question (0-9%, 10-19%, 20% or more of the questionnaire respondents), and (b) an indication of the modal "method of improvement" or "reason for poor performance" suggested for the task.

Directions for a clerical routine for obtaining summary values were prepared. All such values could be determined from frequency distributions by inspection, with no computations needed other than to determine percentage cutoff points on a few questions. It was found that a secretary could, in one day, identify all values for a complete administration of the questionnaire. A format similar to that shown in Figure 3 was used to record these values on each task for later use.

### General Format for Recording Summary Values

Listed Activity	Actual Frequency	Desired Frequency	Activity Importance		Learning Location		Time to Qualify	Improve Procedures	Poor Performance	First Performance
			Incumbents	Commanders	Incumbents	Commanders				
Task #1	1M	1M	Mod. High	High	Job	Job-School	6M	Over 20% (T)	Over 20% (T)	3M
Task #2	1M	1M	Moderate	Low	School	School	1M	Over 20% (H)	Over 10% (N)	1M
Task #3	1W-1M (tie)	1W	High	Very High	Job	Job	6M	Under 10%	Under 10%	1W
Task #451	1W	1D	Mod. High	Very High	Job	Job-School	1M	Under 10%	Over 20% (I)	1W
Task #452	1Y	1M	Moderate	Low	Job	Job	6M	Under 10%	Under 10%	6M

Figure 3

**Occurrence Measure.** The frequency questions yielded one additional set of summary values, the occurrence measure, indicating how many incumbents have performed each task and how many commanders judged that each task should be performed by job incumbents. The values were based on the complement of the proportion of responses in the 0- and 0+ categories of the frequency questions. For each task the occurrence measure indicated whether 85% or more, 50 to 84%, or less than 50% of the respondents indicated some frequency of task performance.

Responses from 50 of the more experienced incumbents indicated that 269 activities had actually been performed by at least 85% of the officers, but 57 of the 452 activities had not been performed by at least 50% of these same officers. Of the commanders, 85% or more said that 363 of the 452 activities should be performed by incumbents with some frequency. On only 10 activities did less than half of the commanders judge that some performance of the task was needed.

**Stability of Summary Values.** To test the stability of the summary values, each group of respondents was divided into two near-equal subgroups on the basis of geographical location. About two-thirds of the summary values were identical when computed separately for these subgroups on selected questions and measures (Table 2). This would indicate adequate discrimination of responses between tasks, considering the variety of response categories frequently used and the varying conditions attributable to geographical and sub-command differences. Almost all of the comparisons were within adjacent response categories (for instance, on frequency questions "once a day" and "once a week" would be adjacent categories).

Table 2  
Comparison of Summary Values Obtained  
From Subgroups of Respondents<sup>a</sup>  
(Percent)

Question or Measure	Identical Values	Identical or Adjacent Values
Actual Frequency	68	96
Desired Frequency	59	93
Importance (Incumbents)	39	72
Importance (Commanders)	52	84
Time to Qualify	57	98
Actual Occurrence	86	100
Desired Occurrence	87	100
Average	64	92

<sup>a</sup>While Na differed slightly, the number of responses entering into each summary value was about 25.

Summary values from the researcher-administered questionnaires appeared reasonably consistent with those of the mailed administration. However, since there were only six respondents in each of the researcher-administered groups, on statistical sampling grounds it would be expected that these summary values would be less stable.

The number of respondents was particularly critical on the questions dealing with procedure improvement and performance problems. At least

21 questionnaire respondents were necessary to obtain a reasonable stability of the summary values for these two questions. About 30 respondents per group should, therefore, be used for any subsequent administration of the questionnaire, thus allowing for a few non-returns and discards.

#### Additional Information

Tasks Written In. One-third of the respondents suggested new equipment and system checks not on the task list. Commanders made 56 suggestions, incumbents 82. Only nine new tasks were suggested by more than two respondents, however, and only two by more than seven respondents. Considerable difficulty was experienced in comparing write-ins, because of the varied terminology used.

Job Aid Suggestions. Nearly one-third of the suggestions for improving procedures dealt with provision of readable, ready-reference handbooks or similar guides for use by the officer on the job (15). This suggestion was made for 13% of the tasks by 10% or more of the commanders. These tasks were in 7 of the 12 job areas of responsibility, although the majority of the suggestions concerned tasks involving equipment operation, system checks, and preventive maintenance. Suggestions of commanders during the researcher administrations of questionnaires indicated the desired nature of many of these aids.

The job aid suggestions provided clues to certain job conditions that might usefully be included in statements of training objectives, to promote effective and efficient task performance. This information was of use in preparing the final statements of training objectives.

#### IMPLICATIONS FOR MODIFICATION OF THE QUESTIONNAIRE

The experimental administration of the Job Activity Questionnaire yielded returns showing considerable effort and care taken in answering the questions properly. The respondents appeared to be quite eager to influence and improve the formal training program, despite their objections to the length and level of detail required by the questionnaire.

The mailed administration thus proved successful in rapidly obtaining information and judgments on specific job tasks from officers immediately and directly concerned with current operations. Their responses represented nearly all occurrences of the job within one major field command. Personally administered questionnaires, while permitting deeper discussion and analysis of issues, required an excessive amount of time and travel by the analysts.

The primary need for modification of the JAQ for possible operational use lay in shortening the time required of questionnaire respondents. As noted earlier, two modifications contributed to achieving this objective:

First, the formal-informal distinction in task performance was dropped for the frequency and importance questions, since it provided little useful guidance on specific tasks; this lessened the complexity of the response categories (and also lessened time required to tabulate responses).

Second, the Training Emphasis question had been included in the Job Activity Questionnaire only for the research purposes. With this question removed, the average time required for JAQ administrations would be shortened considerably.

Additional modifications resulting from the identification of an unnecessary question and reduction in the number of respondent groups needed will be discussed in the next chapter.

## Chapter 4

### RULES FOR SELECTING TASKS FOR TRAINING

Given information about each task, such as that provided by the Job Activity Questionnaire, this information must then be used to identify tasks that most warrant some training in the formal school course. There was a need for some systematic routine by which accurate identifications could be made readily by school personnel. Developing rules for task selection was the final procedure in Phase B of the SAMOFF III process.

#### BACKGROUND

A number of ways have been suggested and used for accomplishing such a selection process. Tyler (1, 16) in discussing educational curricula, both for academic courses and for the Air University, lists five sources of objectives, which he uses to suggest proper selection and elimination of subject matter for a given instructional program. The five sources are studies and information about the students (learners), studies and information about the needs of the profession (or contemporary life outside the school), expert opinion and suggestions from subject specialists, use of a philosophy of education, and use of the psychology of learning.

In a study for curriculum planning at the Air Force Academy, Hahn (17) used critical incidents from numerous officers as to performances that affected feelings toward their jobs and careers. These incidents, along with estimates of time spent on job activities, served in the identification of general skill and knowledge requirements underlying the performances reported.

Selection processes for use in the context of military training are suggested both in HUMPRO publications by Smith (18) and by Melching *et al.* (8) and in work of other organizations (Miller, 9; Gustafson *et al.*, 19; Altman, 20). The consensus appears to favor a systematic identification of instructional requirements by means of a thorough analysis of the work or life situation to be faced by the students. The usual approaches for making these identifications for job instruction are specialized system descriptions and analyses, job descriptions, and task descriptions and analyses. Nearly all of the development and application of these specialized techniques has occurred on equipment operator and technician jobs.

The various bases for selection appear to be oriented toward three general criteria: relevancy of the objectives to the needs of work or life to which students are or will be subjected, essentialness of the intended learning process to meet those needs, and feasibility of the learning needs for attainment through the available instructional system.

Logical development of a basis for selecting tasks needing training involves considering the training policy established for the particular level of job that is of interest. This policy was represented in the present study by the 1958 report of the Department of the Army Officer Education and Training Review

Board (6). Pertinent recommendations of this board were approved for advance planning by the Department of the Army, 22 July 1960, and were reaffirmed in 1962 by a further study of the Army School System (21).

Excerpts from the 1958 report (commonly called the Williams Board Report) indicate the overall training policy for junior officers, specifically for newly commissioned officers. These initial courses (a) will prepare officers "to assume the duties and responsibilities of a junior leader immediately upon assignment," (b) "stress practical work, with a minimum of theoretical instruction," and (c) "should be limited to coverage of those subjects essential to the officer's first duty assignment and which were not adequately covered in previous instruction."

#### PREPARATION OF SELECTION RULES

To translate training policy into working rules for determining what job tasks should be incorporated into a specific formal course for officers, a series of "Selection Rules" were formulated. They defined the training policy in terms appropriate for judging whether each activity listed for a job should or should not be included in the program of instruction, on the basis of information obtainable by questionnaires from field personnel.

The rationale used in converting training policy into working rules may be summarized as follows:

(1) Formal school training must be limited to items of general significance. Tasks would not be selected for training if they are to be performed by only a few of the job incumbents, are to be performed very infrequently, or are of very low importance to effective unit operation.

(2) Formal schooling need not be concerned with matters already being handled satisfactorily through other available learning experiences. Tasks would not be selected if they are being learned adequately on the job, or if adequate skills are acquired through earlier experience.

(3) Tasks would be selected for treatment in formal schooling if they are of some importance and frequency and if pre- and post-school learning experiences are not proving adequate. This involves identifying tasks on which incumbents are having difficulty in performing appropriately or effectively. Indicators include: (a) large discrepancies between the judgments of incumbents and their commanders on certain issues; (b) areas of poor performance, with no readily available means of correcting the learning discrepancy at a central location; (c) difficulties in obtaining desired performance from new job assignees.

(4) One of the most crucial indicators of need for formal schooling is early requirement on the job for important task skills, not previously acquired.

This rationale leads to the policy of preparing the junior officer for effective performance in the job to which he will be assigned upon completion of the school training. It attempts to reduce this training to a minimum by excluding matters adequately learned elsewhere, or not essential for performance. On the other hand, it attempts to identify essential training requirements by indications of performance inadequacies and by judged utility of school training for particular tasks, provided by officers closely concerned with current operational needs in field organizations.

Data on which to apply experimental working rules had been provided by the Job Activity Questionnaire through the questions on task frequency, importance, performance problems, and so forth. Each rule was developed to

represent a pattern of responses rather than a single value of some sort; thus, no task was selected or rejected by the judgment of one group of respondents on only one question.

A set of tentative selection rules was hypothesized prior to the experimental questionnaire administration. These rules were then tried out on the data from the questionnaire to determine their utility and to eliminate any of little consequence to the selection process.

The rules were designed to be applied in three stages:

Step 1—Eliminate tasks on the basis of low importance or little need for performance.

Step 2—From the remaining activities, select tasks for inclusion in training on the basis of various specified reasons indicating need and importance of training.

Step 3—From the remaining activities, eliminate tasks on the basis of positive evidence that the learning experiences were being provided by other available sources.

It was expected that, in these three stages, almost all of the tasks would be either rejected or selected for training; however, no prescribed procedure is likely to account for all contingencies unless some rule is set up to cover "all remaining" activities. Such a rule was not established for the experiment; any tasks that failed to meet specific conditions for selection or rejection were eliminated from further consideration. Such tasks could be designated for training if considerations other than those provided by the selection rules indicated a training requirement.

## RESULTS OF SELECTION RULE ANALYSES

### Use of JAQ Questions

Examination of selections made by the original set of rules identified one question, Time to First Performance, that could be eliminated from the analysis without any appreciable change in the selections or rejections of tasks. Trial elimination of data from the other questions resulted in substantial variations of task selections and rejections.

This finding meant that the Time to First Performance question could be dropped from the Job Activity Questionnaires, shortening the administration time for incumbents. Only three questions actually needed to be administered to job incumbents in the JAQ.

Deletion of the Time to First Performance question also diminished the need for having JAQ responses from incumbents having only a little job experience (for this question, data from incumbents with less than six months of job experience had been given primary attention). In subsequent use of the JAQ, this would make it feasible to use only officers with more than some minimal level of job experience.

Final selection rules (Appendix B) were revised to reflect these changes. In applying the final version of the rules in this experiment, summary values were used only from those incumbents with more than the median level of job experience (6 months).

### Task Selections and Rejections

Application of the final selection rules resulted in selection of 101 activities for inclusion in training—22% of all items listed in the activities booklet.

Sixty-six percent of the 452 items were rejected. For the remaining 12% it was not possible to make any decision by means of the selection rules.

Activities were selected from 9 of the 12 job areas of responsibility, as shown in Table 3. Activities in the tactical aspects of the job, involving the operation and maintenance of the fire control equipment, constituted 60% of the selections. Each selection rule contributed to the making of these decisions, although four of the rules each applied to fewer than ten activities (Appendix Table B-1)

Table 3

**Selections and Rejections of Tasks for inclusion in Training**

Job Area of Responsibility	Total Activities Listed	Number of Activities		
		Selected	Rejected	Undecided
Tactical Operations	51	25	9	17
Operational Readiness	56	35	16	5
Organizational Maintenance	51	3	43	5
March Ordering and Emplacement	3	0	3	0
Parts Supply	46	8	25	2
Manning	29	0	27	2
Job Training	56	6	46	4
Military Discipline, Personal Welfare, and Morale	48	3	45	0
Safety	33	8	19	6
Security	33	10	17	6
Additional Duties (within battery)	36	0	33	3
Secondary Duties and Details (outside battery)	10	3	5	2
<b>Total</b>	<b>452</b>	<b>101</b>	<b>299</b>	<b>52</b>
<b>Percentage of total</b>		<b>22</b>	<b>66</b>	<b>12</b>

First-stage rules were applied in 168 instances, to reject 149 activities. In the second-stage the rules applied in 203 cases, to select the 101 activities for training. The third stage resulted in 195 rule applications, to reject a final 150 tasks. This process resulted in specific selection or rejection of all but 52 of the tasks (see Table 4).

Table 4

**Application of Selection Rules**

Stage	Rule	Basis for Application	Number of Times Rule Applied	
			Rejection	Selection
1	1-4	Low frequency and/or importance	168	
2	5-8	Discrepancy between commander and incumbent responses		45
	9	Learning difficulties		19
	10-13	Usefulness of school training for essential tasks		65
	14-18	Performance problems		74
3	19-21	Training considerations	195	
		Total rule applications	363	203
		Activities represented	299	101



### "No Decision" Items

Examination of the 52 "no decision" activities showed that one-third were in the job area of responsibility of tactical operations. Many of these activities depend heavily upon a knowledge of local operating policies and procedures, making it impractical to include them in training at the service school.

On three-fourths of the "no decision" activities, commanders had judged them as being performed satisfactorily by experienced platoon leaders, indicating that job experience adequately accomplished the necessary training. Comments indicated that some of the remaining items presumably could be performed adequately if appropriate job aids were provided for the officers' use.

### Selections Compared to Learning Location Responses

In the Job Activity Questionnaire job incumbents and their commanders were asked to judge whether the main effort to learn a task should be made in the school course, or whether it should be made before or after school attendance. On the possibility that this single measure might identify tasks for school training, the Learning Location responses were compared with the decisions made by the selection rules. Learning Location responses were divided into six categories on the basis of summary values of each of the two respondent groups.

The relationships between the two sets of decisions are shown in Table 5. As indicated by the boxed areas in the table, on 72% of the items the two measures agreed on selections and rejections, with 54 common selections and

Table 5  
Comparison of Training Decisions:  
Selection Rules Versus Learning Location Responses

Ranked Responses to Learning Location Question	Selection Rule Results <sup>a</sup>		
	Select	No Decision	Reject
School Training Definitely Indicated:			
1. "School" was modal response by both incumbents and commanders	31	1	15
2. "School" was modal response by one group, and secondary suggestion of other group	8	4	11
3. "School" was secondary suggestion by both incumbents and commanders	15	2	1
School Training Less Definite or Not Indicated:			
4. "School" was modal response of one group, and not suggested by other group	0	4	35
5. "School" was secondary suggestion of one group, and not suggested by other group	10	17	13
6. "School" was not suggested by either group	37	24	224
Selection Rule Totals	101	52	299

<sup>a</sup>Boxed areas show agreement on 72% (326) of the items.

272 common rejections. There remained, however, 126 tasks on which the two measures disagreed. The selection rules selected 48 of these for training, and the Learning Location responses selected 34 others.

Of the 88 tasks identified for school training by the Learning Location question, 61% also had been selected by the rules. Examination of the remaining 34 tasks showed that nearly all of them were rejected on the basis of low importance. Of the 364 tasks not identified for school training by the Learning Location question, 13% were selected by the rules. About 80% of these selections were the result of judgment differences between commanders and incumbents on questions of task frequency and importance (Selection Rules 5-8).

The three questions on Frequency, Importance, and Learning Location appeared to carry the major weight in task selections. Replications of rule application on other jobs would be necessary to verify a shorter set of rules based only on these three questions, since they deviate from the rationale of the more complete set of rules.

#### Selections Compared to School Program of Instruction

The 101 job tasks selected for training were compared with the instruction topics listed in the Program of Instruction (POI) for 44-A-C20, Air Defense Officer Basic Course, dated March 1963. This is the formal school course usually attended by a junior officer immediately prior to his assignment to the job of Nike Hercules Fire Control Platoon Leader.

The POI topics dealt, in some degree, with all but 21 of the 101 selected job activities. The course included 84% of the selected tasks pertaining to equipment operation and maintenance, and 68% of tasks selected in other job areas of responsibility. POI topic representation covered most of the job areas of responsibility, as shown in Table 6.

Table 6

#### **Comparison of Selected Tasks With School Course\***

Job Area of Responsibility	Number of Tasks Included in POI	Number of Tasks Not Included in POI
Tactical Operations	22	3
Operational Readiness	29	6
Organizational Maintenance	3	0
Parts Supply	8	0
Job Training	2	4
Military Discipline Personal Welfare, and Morale	1	2
Safety	7	1
Security	8	2
Secondary Duties and Details (outside battery)	0	3
Total	80	21

\*Program of Instruction for 44-A-C20, Air Defense Officer Basic Course, March 1963.

#### **IMPLICATIONS FOR MODIFICATION OF SELECTION RULES**

The selection rules provided a procedure for using information and judgments from Job Activity Questionnaire responses in a systematic fashion to

identify activities that should be included in school training. Applied sequentially, the rules made it possible to (a) reject activities on the basis of performance frequency, occurrence, and importance; (b) select activities on the basis of judgmental differences, identified problem areas, and positive indications of formal schooling as the desirable location of training; (c) reject activities on the basis of adequacy of performance and positive indications of other locations for learning. Identification, during this process, of problem areas not covered by school training could become a stimulus for corrective action by field commands and units.

Following revisions to eliminate data from the Time to First Performance question and the responses of inexperienced job incumbents, application of the final selection rules resulted in the selection for school training of 101 tasks (22%) from the job of Nike Hercules Fire Control Platoon Leader. Their selection indicated that they were the activities most requiring the formal school training that normally precedes assignment to that job. Most of these tasks were already considered sufficiently important for training to be included in the existing Program of Instruction for the course. However, the course also included fire control matters that were not selected for training by the rules. Thus, the task selection process was more restrictive than the existent course content. Indecisive results on some tasks under the selection rules appeared to be inconsequential to formal training, although closer examination by school managers might identify some training needs based on other considerations.

Task selections were made across nearly all job areas of responsibility, although the majority dealt with tactical equipment operation and maintenance management. This emphasis is an appropriate one for a leader position in a unit with a tactical weapon mission like that of a Nike Hercules fire unit. However, the results indicated that many other aspects of the job should not be overlooked in training, since effective performance in these areas was also an essential part of the job.

The rules also proved effective in selecting, for training, certain tasks that would be important in wartime, even though the tasks are not frequently performed in normal peacetime operations. The generality of this feature of the rules should be examined for its application to other officer jobs.

The data-gathering process and the selection rules were developed in terms of a job that currently exists, making it possible to obtain judgments from officers intimately involved in daily operations. Certain of the questions were only suitable under these conditions. For a job that does not yet exist, or when there are very few experienced job incumbents to whom questionnaires may be administered, it would be of interest to determine what questions and rules would still be useful, particularly when information on specific tasks must be gathered from less knowledgeable sources. The influence exercised by the Frequency, Importance, and Learning Location questions may provide a clue to rule modifications that could be applied in such situations.

As a result of the elimination of one question, administration of the Job Activity Questionnaire would now require only one group of job incumbents (essentially those with at least several months' experience in the position). Two groups of commanders would still be needed, but no officer would answer more than three questions, one of which is quite short. Under these circumstances, the average time for answering the questionnaire should be about half a day per respondent, when 400 job activities are involved. The proposed

### Proposed Assignment of Questions in Job Activity Questionnaire

Question	Job Incumbents	Immediate Commanders	
		One Half	Other Half
Actual Frequency of Performance	1		
Desired Frequency of Performance			1
Activity Importance	2	2	
Learning Location	3		2
Time to Qualify		1	
Possible to Improve Procedures		3	
Poorly Performed Activity			3

Note: Numbers indicate order in which respondent should answer the questions.

Figure 4

order for administering questions to respondents in each group is shown in Figure 4.

This modification should make it feasible for school personnel to administer the questionnaire on a variety of occasions when currently experienced officers become available, such as on one-day visits to field units by school personnel, or at the time a field-experienced officer reports for duty or training at the school. After the questionnaire has been answered by sufficient numbers of respondents, reapplication of the selection rules would keep task selections for training responsive to current needs of the job and identify new problem areas as they develop.

## Chapter 5

### IDENTIFICATION OF TRAINING EMPHASES

The selection rules serve only to identify job tasks that need some formal school training. There still remains the problem of identifying what aspects or features of these tasks should be emphasized in the training program. Activities toward this end constitute Phase C in the overall procedures for developing training objectives.

#### BACKGROUND

This problem is crucial in the training of officers for whom task features other than skill in actual task performance may be the essential things to be learned. If the officer need learn only when it is appropriate for a task to be performed, it would be highly uneconomical to train him also on how to perform it. Such distinctions may often be ignored in training for operator and maintenance jobs, in which there is a more common need for acquiring performance skills. The nature of officer jobs, however, calls for flexibility and adaptability to various job situations, with considerably less need for specific procedural skills.

As previously indicated, a Training Emphasis question was administered with the experimental Job Activity Questionnaire to yield information for use after tasks had been selected for training. This question sought judgments as to what aspects of a task were most important for emphasis in the formal training.

This approach was derived from the Miller and Van Cott (22) concept of "job knowledge analysis." They presented a checklist of 15 job situations that usually require the application of some kind of job knowledge. Their knowledge analysis categories were developed for man-machine tasks, and hence were not particularly applicable for identifying training needs of officer tasks, but their concept provided the impetus for developing a list of factors that would be suitable for officer tasks. Many of the Miller and Van Cott categories (such as precautions, calculations, anticipations, strategies, and use of tools) would, however, be applicable within the detailed descriptions to be subsequently developed for officer tasks.<sup>1</sup>

#### CATEGORIES OF TRAINING EMPHASIS

The notions of cue, response, and intent formed the major basis for preparing the list of emphasis categories. That is, it was assumed that major

<sup>1</sup>An approach to the identification of task knowledge components that are essential for training has been suggested recently by Gagné (23). This approach, under the present state of the art, would appear to require considerable skill and background in the psychology of learning for its effective accomplishment. It also yields increasingly more general knowledge components representative of broader educational goals. While such knowledges would probably lead to successful performance of a class of tasks, this purpose would not be compatible with the training of specific selected job tasks nor the rationale of selecting tasks for training in advance of detailed descriptions of job activities.

training factors for officer tasks would deal with when to perform the task, how to perform it, and/or why it should be performed. While in many cases experience on the job is a necessary ingredient, training should be able to reduce the need for experience by concentrating on basic skills and knowledges. Job experience can then build on this foundation.

Emphases on How To Do It. Three categories represented three general skill characteristics in which training would most likely be concerned:

- (1) Ability to do the activity (specific steps of procedure, without special time or accuracy requirements).
- (2) Ability to perform the activity with a high degree of accuracy and/or speed.
- (3) Ability to perform the activity under unique or unusual circumstances (including emergency conditions).

The latter two categories would include the first, which represented a "normal" performance procedure unhampered by malfunctions or operational stresses.

Emphases on When. Knowledge of cues for beginning an activity, and the associated job use of such knowledge, was represented by two categories:

- (1) Ability to determine when the activity should be performed.
- (2) Knowledge of alternate procedures for the activity; ability to determine when to use them.

Emphases on Why. Similarly, knowledge associated with the intent of the task was covered by two categories:

- (1) Knowledge of standards and acceptable tolerance limits; ability to detect discrepancies.
- (2) Knowledge of the effects performance of the activity will have upon the equipment, the system, or other people.

Emphasis on Background Knowledge. In addition to the cue-response-intent training factor, two categories dealt with typical background knowledge of use to personnel entering a new field of assignment:

- (1) Knowledge of the location or nomenclature of items related to the activity.
- (2) Knowledge of reference sources pertaining to the activity.

Two self-explanatory categories completed the set of possible responses:

- (1) No training is necessary for the activity: All factors can best be learned on the job or have already been learned prior to school attendance, or the activity is not necessary for officers in this job assignment.
- (2) Other: (Write-in.)

These categories provided a checklist of major features for training of officer tasks. For each task a rater would check the two categories he judged to be most important for formal training. These judgments would then be used as the basis for preparing detailed descriptions of selected tasks, concentrating on the identified training aspects.

#### TRAINING EMPHASIS QUESTIONNAIRE

Although in this research the Training Emphasis question was administered with the Job Activity Questionnaire, it would normally not be administered until after tasks had been selected for training. The time required to answer the question would be considerably shortened by the need to cover only the selected tasks, rather than all those in the original task inventory. Administration of the question—the Training Emphasis Questionnaire (TEQ)—would be

accomplished by mail in the same manner as the JAQ, using both experienced incumbents and immediate commanders as respondents.

In administering the TEQ to respondents at this later stage, there would be no need to list selected tasks on which the training emphasis needed is already known. For a substantial number of tasks, this information is supplied through the operation of the selection rules. For example, on tasks selected because of response differences between incumbents and commanders (Selection Rules 5-8), the existence of such judgmental differences on frequency, occurrence, or importance of tasks is in itself an indication of the training need. Other tasks on which the training emphasis needed was evident from the selection process were highly important tasks that were needed early but on which commanders considered performance to be poor because of lack of interest or poor attitude (Selection Rules 14-15). Poor performance by experienced incumbents for such a reason was indicative of some training need not met in the field.

Each of these six selection rules implies the need for an awareness of the purposes for which the activity is performed. The student must be taught the activity's value and utility. It was assumed that knowing the purposes served by the activity would enable officers to act more in accord with the interests of their commanders. In a sense, this training aspect implies that knowledge of the viewpoint established by proper authorities is essential to the adequate performance of the task on the job. This particular area for training emphasis was labeled "knowledge of the job purposes that may be served by performance of the activity." For activities selected only on the basis of these six rules there would be no need to administer the TEQ.

#### RESULTS OF TRAINING EMPHASIS QUESTION

Of the 101 selected activities, 40 were selected solely on the basis of the selection rules indicating need for knowledge of purposes.<sup>1</sup> The remaining 61 activities warranted further investigation for matters of training emphasis.

The great majority (82%) of these 61 activities pertained to equipment operation or maintenance management, and the remaining 18% were in areas of job training, safety, security, and secondary job duties. Such a ratio was to be expected for this particular officer job, which is so largely oriented toward a weapon system.

For an emphasis category to be listed, it had to be selected by at least one-third of the respondents in a group (a smaller ratio leads to less certain indicators of emphasis and too many emphases per job task). Experienced job incumbents judged 116 training emphases to be appropriate to the 61 activities; experienced commanders judged 122 emphases to be appropriate (Table 7). Commanders agreed with 92 of the 116 incumbent emphases, with most disagreement occurring on emphasis categories of "Do," "Unusual," and "Location." This amount of agreement between two different groups of respondents indicated reasonable consistency of judgments on the question, although each group could still demonstrate its special concerns.

Any tendency to overuse the "Do" response category was counteracted by requiring that both incumbent and commander groups must select that category for it to be accepted as an indicator of training emphasis. On other categories, an indication of emphasis by either group was considered sufficient. Since ability in normal task performance can be presumed if there is ability to

<sup>1</sup>Eight tasks were selected both on this basis and for one of the other selection reasons.

**Table 7**  
**Distributions of Training Emphasis Indications for 61 Activities**

Training Emphasis (Abbreviated Identifier)	Experienced Job Incumbents	Experienced Commanders	Identical in Both Groups
Do (perform normal procedure)	35	47	27
Accuracy and/or Speed (combined) (perform with accuracy or speed)	17	18	17
Unusual (perform under unusual or non-normal conditions)	4	2	1
When (determine when to perform)	2	3	1
Alternate (know when to perform alternate procedures, and perform them)	2	2	2
Tolerances (know standards and detect discrepancies)	37	38	34
Effects (perceive likely effect of performance)	3	2	1
Location (know location and/or nomenclature)	5	0	0
References (identify applicable reference sources)	11	10	9
Total	116	122	92

perform with speed or accuracy or under unusual conditions, the "Do" indication was superfluous when any of these other performance requirements were selected for training emphasis. The large number of indications in the "Tolerances" category did not constitute overuse, since it reflected the large number of selected tasks involving system and equipment checks

Three response categories were revised in the final version of the Training Emphasis question:

(1) The "Alternate" category was dropped, since it would require essentially the same detailed activity description as would the "Unusual" category. In the two tasks eliciting the "Alternate" emphasis, the "Unusual" emphasis also applied.

(2) In preparing detailed descriptions on the basis of the "Accuracy and/or Speed" indications, it was found that more discriminating guidance would have been useful. Therefore, this category was split into two categories of "Accuracy" and "Speed" in the final version.

(3) Since the question would be asked only with regard to tasks already selected for training, the "No Training" response category would not be needed.

The net result of emphasis indications for the 61 selected tasks is shown in Table 8, which also includes the "Job Purposes" learning requirements. For the total of 101 selected tasks, 160 statements of training objectives would be required.

Only 46 of the 160 objectives necessitated acquiring the ability to perform the actual job tasks. Thus, in the next step of the procedures, detailed procedural task descriptions would need to be prepared for only 46 objectives, rather than for each of the original 452 job tasks in the List of Activities.

In the experimental administration, despite the fact that they had to answer the Training Emphasis question for all 452 listed activities, several commanders commented that this question appeared more worthy of their time than the other questions.



Table 8

## Types of General Performance Requirements for the 101 Selected Activities

Short Title of Training Emphasis: Performance Requirement	Job Areas of Responsibility									Total
	Tactical Operations	Operational Readiness	Organizational Maintenance	Parts Supply	Job Training	Discipline, Welfare, Morale	Safety	Security	Secondary Duties	
Do		15			2		1	2	3	23
Accuracy and/or Speed	18									18
Unusual	5									5
When	3	1								4
Tolerances	4	31	1		3		1	1		41
Effects		2			1			1		4
Location		5								5
References		2			2		1	4	3	12
Job Purposes	9	8	3	8	4	3	7	6		48
Total	39	64	4	8	12	3	10	14	6	160
Number of Activity Statements Involved	25	35	3	8	6	3	8	10	3	101

## GENERAL STATEMENTS OF TRAINING OBJECTIVES

The various training emphases correspond to "learning tasks" required of the students. As distinguished from job tasks, learning tasks represent the job of being a student and specify the skills he must acquire. In this sense, the training emphases (or learning tasks) are directly relevant to behavioral statements of training objectives, and one of their uses in these procedures was for this purpose. Combining a selected job task with one of the categories of training emphasis provided a quick determination of a behavioral training objective.

While this type of training objective does not meet all of the requirements for a complete statement (since it does not specify the standards of performance, etc.), it nevertheless provided a general indication of the learning requirement. Distinguishing between two components, the learning task and the job task, is similar to Tyler's two-dimensional statements of objectives (1). Tyler proposed that objectives be stated in terms of both the behavioral and the content aspects to be developed in the student.

The complete listing of selected tasks and associated general performance requirements is given in Appendix C. This listing presents a matrix of job activity statements and coded indications of the general behaviors that may be associated with each. These general behavior codes--verbal statements of each general behavior--are an integral part of the procedures to assist the analysts. They are standard sentences that may be used in preparing general statements of each training objective.

Use of the word "recognize" in five of these sentences implies that the student is able to perceive or identify the particular activity characteristic in a job or job-like situation; that is, he must be able to use the information

effectively in performing his job.' The sentences do not describe levels or degrees of proficiency, but rather represent kinds of learning tasks for trainees.

If additional information pertinent to an objective has been determined at this time in the accomplishment of the procedures, it may be included in a general statement of the training objective, as in the first two of the following examples showing combinations of general behaviors with job activities:

- (1) Behavior D:  
With aid of a well-illustrated handbook (or other such aid) describing in nontechnical language the step-by-step procedures, the student is able to participate in the conduct of a computer dynamics course check.
- (2) Behavior S:  
The student is able to serve as Battery Control Officer during a platoon training crew drill, completing the drill within fifteen minutes without sequence error in observable BCO actions.
- (3) Behavior W:  
The student is able to recognize when the authenticity of a voice communication should be determined.
- (4) Behavior E:  
The student is able to recognize the effects that may result from his preparation of an Officer Efficiency Report.
- (5) Behavior P:  
The student is able to recognize the job purpose to be served by his informing a platoon member of an unsafe practice.

Comparison of the 160 general performance objectives was attempted with the applicable Program of Instruction. Only rough inferences of comparability could be made, however, because of the distinctly different manner in which course subjects were described by topical subjects in the POI. The POI appeared to yield instructional topics that were applicable to 118 (74%) of the 160 derived training objectives. These occurred in a wide variety of job areas of responsibility.

Such general statements of training objectives may be quite useful for early planning of instructional programs, and have the advantage of being identified before the Detailed Activity Descriptions are prepared. Their brevity of statement (compared to that of the complete training objectives) may be useful for many of the needs of training managers.

Periodic reaccomplishment of Phases B and C, involving only the administration and analysis of the two questionnaires, would provide a simple means of assuring that the general objectives remain responsive to current operational needs. For actual curriculum and test construction, however, development of detailed training objectives is necessary.

'For example, if the objective was to *recognize* reference sources, the test item evaluating a student's ability might be constructed: "Given a typical orderly room bookshelf of Army publications, and assuming you have just been appointed as Class A Paying Agent for the first time, *locate* the specific directives and instructions pertinent to this additional duty." Thus, the test behavior would closely correspond to actual job behavior in use of the knowledge.

## Chapter 6

### OBTAINING DETAILED INFORMATION ON TASK ASPECTS

The preceding phases of the SAMOFF III method resulted in the selection of those tasks requiring formal instruction and the identification of the training emphases required for each of these tasks. Completion of these phases of the method provided general statements of training objectives that would be of value to school management personnel for preparing programs of instruction and course outlines.

However, more detailed descriptions needed to be developed in order to achieve all the benefits to be derived from specifying training objectives. By the time the analysts had completed the previous phases, considerable job information was available for use in preparing the Detailed Activity Descriptions (DADs) of Phase D of the SAMOFF III method.

#### BACKGROUND

In applying the cue-response approach to officer task descriptions, the major concern was whether it could adequately describe tasks not directly involved with equipment operation and maintenance—in particular, tasks that are nonproceduralized or consist of extremely varied sequencing for steps and actions. Analysts needed information on what components of the usual cue-response description (9) and what additional task analysis information would be needed for preparation of training objectives.

The fact that the DAD procedures were to be feasible for use by military personnel at Army service schools had to be kept in mind. Many of the concepts variously proposed for task description and analysis require considerable skill and special knowledge on the part of the analyst. A requirement in the present research was that the analysis procedures must be consistent with the capabilities of military personnel typically assigned and available to the service schools. Such personnel are directly concerned with military training programs, and have knowledge of the service branch in which the analyzed job exists, but they are not specifically prepared to be job or training analysts. However, most sources of job information would be available to them.

#### DEVELOPMENT OF PROCEDURES FOR PREPARING DETAILED ACTIVITY DESCRIPTIONS

Military directives and reference publications, along with extensive interviewing of officers familiar with the job, were used as the principal information sources for Detailed Activity Descriptions.

In developing the final procedures, researchers applied several variations of the cue-response description format to a number of officer tasks in three areas of job responsibility for the Nike Hercules Fire Control Platoon Leader: (a) the officer's tactical role in equipment operation, (b) performance of system checks in management of equipment operational readiness, and

(c) typical nonproceduralized information-gathering tasks performed in the management of job training for unit personnel.

Trial applications resulted in the formulation of particular information categories and descriptive content, taking into consideration the nature of information likely to be available to service schools for existing officer jobs and the usefulness of the information to the needs of training objectives. From these trial applications it was possible to identify many description problem areas. Procedural instructions and illustrative material were then prepared to guide and assist analysts in preparing adequate procedural descriptions.

#### ADEQUACY AND FEASIBILITY OF DESCRIPTION PROCEDURES

##### Content Indications

The general behavior requirements as identified by training emphases categories and certain selection rules were used as indicators of what the Detailed Activity Descriptions should cover in each situation. If the student must be able to perform the job task, the DAD had to describe how that task was adequately performed. If the student needed only to be able to use certain task knowledge, the DAD had to specify that knowledge and indicate its use.

Additionally, for each type of activity statement, as evolved from the Initial Job Description prepared in Phase A (11), the analyst was directed to certain matters that were particularly important in the description of each kind of job activity. This guidance showed the analyst the specific nature of information that he should seek and record.

A standardized format was provided for recording the information. This format was not radically different from that in which operator tasks and maintenance checks and adjustments are described in current Army technical manuals. Basically, it consisted of a four-column form (Fig. 5) with specific types of information to be recorded in each column for each procedural step or action. The third column was used to show response adequacy for each step supplying the information needed for specifying the necessary job standards of performance for the training objective. The first page of the description was used to describe matters pertinent to the whole task, including the job conditions under which the task must be performed; following pages pertained to component steps and actions. An illustration of the format used in the description of an equipment check as performed by the officer is shown in Appendix

##### **Basic Format for Description of Procedures**

<u>Column 1</u>	<u>Column 2</u>	<u>Column 3</u>	<u>Column 4</u>
When to perform each step and action	Procedural steps and actions	What is to be accomplished, and indicators of accomplishment	Precautions and comments (as appropriate)

Figure 5

When the description had to cover a variety of alternate or "non-normal" actions, another column was added to the form for recording indications of th

need to modify the normal procedure and the nature of the actions to be substituted (e.g., "If X light fails to illuminate, reset switch Y").

### Problems of the Analyst

Application of the DAD procedures on the platoon leader job position provided information on several potential problem areas for analysts.

Identifying cues for performing each procedural step or action. These cues often emanate from sources other than physical equipment indicators, such as configurations of preceding events or actions, anticipation of forthcoming events or conditions, reactions of other people, and the timing of action performance. The use of three types of action indicators (along with probing questions in interviews) was found to be useful and reasonably effective in making the necessary cue identifications (see examples in Appendix E).

These three cue categories were (a) "mandatory" indications (informing the officer that the step or action must be performed at that time); (b) "permissive" indications (showing that the step or action may be performed, but is not required at a given moment); (c) "forbidding" indications (prohibiting the performance at that time). Equipment indications generally fell into the "mandatory" category; safety and performance precautions often occurred as permissive or prohibiting indicators.

Identifying the indications of response adequacy, to inform the officer that the action was effectively accomplished. For some task steps and actions in which there are no immediately discernible indications of response adequacy, the most meaningful information for students learning to perform the task appeared to be a statement of purpose or intent of the action, or of the use to which the results of that action would be put. Thus, if the action was of the type by which information is obtained, the determinations or judgments (in which the information is to be used at some later time) would be listed. For such actions the specific kinds of information to be obtained also could be listed.

This use of the action purpose and intent was consistent with its previous emphasis in preparing the Initial Job Description, assisting the trainee in recognizing and acting upon the action stimulus. While purposes and intents could not be stated as explicitly as the more immediate indications of response adequacy, they provided considerable training information in the absence of more objective indications.

Recording action sequences for tasks in which performance is not proceduralized. In some tasks actions had to be accommodated to varying conditions occurring during task performance, or relevant in a particular instance. Since procedural steps and actions were recorded in outline form, subordinate levels within a step indicated either a more detailed breakdown of the action or alternate acceptable means of accomplishing that step (with associated cues for selecting the alternates when appropriate). Appendices D and E illustrate this format. Identifying step numbers were used to indicate a sequential order; alphabetic letters were used to indicate a nonsequential arrangement or alternate means. Both the cues for action (mandatory or permissive) and the order of action performance were clearly defined.

Determining which of several procedures to record. This was a common problem, since for many officer tasks one best or most appropriate means of accomplishment has never been prescribed (although this is done for many operation and maintenance tasks). Since the purpose in training is to permit the officer to perform his job effectively, and not primarily to improve work

methods, it was decided to emphasize procedures actually used by experienced job incumbents in effectively performing a task. While this approach may not produce the most efficient procedures, it should yield a description of adequate means by which inexperienced officers may attain the task objectives.

If a task has a procedure prescribed by command directives, that procedure would be the one used for training. If there is more than one adequate procedure, each may be described (with notation of their optional use); in describing Fire Control Platoon Leader tasks, the number of indentifiable optional actions or task procedures was usually quite small, so there was no major recording problem. "Tricks of the trade" and local "rules of thumb," which are often quite useful to trainees, were explicitly sought and recorded, although clearly noted as being nondirective.

It should be noted that these were descriptions of what the officer does. Technical Manual descriptions of a check procedure for maintenance men were not usually suitable. The officer was more likely to use a briefer and less technical procedure, such as described in the DA PAM 750-1 series, Preventive Maintenance Guide for Commanders. This approach is illustrated in Appendix D.

Determining an appropriate level of procedural detail and specificity for a task description. To provide guidance for the analyst, and to assure that all necessary skill and knowledge components were included, an appropriate description level was defined: The description should enable a typical untrained student to accomplish the task by following the written procedure, under no time pressure. This standard was equivalent to that proposed by Miller (9): "The level of detail for specifying task activities is about that used in a good manual of instructions to a novice." Use of this level of description will tend to standardize the version of the procedure taught by all training instructors and used by all evaluators of training as evidence of appropriate task accomplishment.

Application of this standard indicated a number of information needs in addition to the cues, responses, and indications of response adequacy. The trainee would also need to know:

- (1) The location of items with which he must work.
- (2) Definitions of new terminology.
- (3) Precautions to prevent injury, damage, or performance error.
- (4) Events that may tend to interfere with effective performance.

Whenever it could be validly assumed that all training personnel would be fully knowledgeable as to what constitutes proper performance of a task, then no detail need be provided. Such a possibility might exist for a commonly understood task such as field-stripping the major components of the M14 rifle, although there still would be the requirement of identifying the job conditions under which the task is performed. In view of the need for uniformity in what is taught by Army school personnel, it appeared unlikely that instructors could be relied upon to provide the necessary detail for most of the selected job activities.

Most of these guidelines for the analyst were developed as a result of experiences in attempts to provide adequate task descriptions for the job of Fire Control Platoon Leader. Many of their features are represented in the information-gathering task described in Appendix E. Descriptions by Army school personnel of other tasks may identify additional problem areas, but the provided aids, examples, and techniques should be useful guidance for resolving any unforeseen difficulties.

### Information Sources

The first source of information used in preparing any detailed description were publications pertaining to the task. These included command directives, manuals, training literature, SOPs, previous task descriptions, and documents of equipment manufacturers. Inspection reports were a prime source of information on many standards of task performance, reflecting those actually employed on the job and of immediate concern to job incumbents.

With this information the analysts prepared tentative or rough descriptions, which provided an effective base for refinement by means of interviews with individuals who were knowledgeable about the existing conditions of task performance. For the majority of the tasks selected for training, this meant Air Defense officers with recent experience in performing these tasks. These individuals also supplied additional information as needed to complete a description.

Depending upon the activity to be described and the kind of information needed, various other "subject matter experts" (e.g., safety experts, CBR specialists) were also interviewed for detailed information. Subject matter specialists would be particularly necessary for describing wartime tasks in which job incumbents may not obtain realistic experience. In general, the primary sources of accurate information were interviews with officers who have had sufficient recent experience in the activity to perform it successfully.

In the case of DADs being prepared for actual use in training, the final step should be submission to field commands and training agencies for review, to identify any descriptions that may be in violation of existing command policies and directives.

### SUMMARY OF DETAILED DESCRIPTION PROCEDURES

To determine feasible and necessary components for use in describing officer tasks, various types of tasks of the Nike Hercules Fire Control Platoon Leader were subjected to cue-response description. The resultant procedure for describing task performance was a composite of features of both task description and task analysis.

The basic cue-response format for describing a procedure has been retained, but with many aids to guide the analyst's efforts to obtain the necessary information for all kinds of job activities. The composite process does not go into the minute behavioral implications proposed in some task analyses, but does include such features as the implications of action responses, response options, and goal orientation for task performance. Nearly all basic aspects of task description are included, although the nature of the general behavior requirement dictated the relative emphasis to be placed on recording such factors as performance time and response alternatives.

Those general behavior requirements that did not require performance of the actual job task were viewed as special cases of the performance description. They dealt with the task as a whole, rather than with all component steps and actions.

## Chapter 7

### CONSTRUCTION OF STATEMENTS OF TRAINING OBJECTIVES

Two types of training objective statements were constructed by the SAMOFF III method. The first type, consisting of a single sentence in which the general behavior requirement was briefly stated, was available upon completion of the Training Emphasis Questionnaire. This type of statement, while useful for planning by school management personnel, did not meet the requirements for complete and clear communication of what the trainee should be able to do after he completes the program of instruction. Therefore, as the final step in Phase D, a second type of statement was prepared from all obtained information, including that from the Detailed Activity Description.

#### PREPARING THE FINAL STATEMENTS OF OBJECTIVES

The lengthier and more complete final statement of the training objective specified what the student must be able to do, the standards for student performance, and the job conditions or situations relevant to the performance requirement. This detailed statement would be of use primarily to the school division that prepares the actual instructional material (including the specific lesson plans and training literature) and the division that prepares tests to evaluate student achievement.

Two standardized formats (Figs. 6, 7) were prepared for the complete statements of the two major kinds of student performance requirements, depending on whether or not the student had to be able to perform the actual job activity. The basic outline consisted of three categories of information:

- (1) The general behavior requirement.
- (2) The job conditions or situations under which the student is to demonstrate performance.
- (3) Details of the particular aspects or features of the job activity that are to be emphasized.

When the student had to be trained to perform the task, DAD materials were entered directly in the training objective statement, except that precautions and comments (last column of the DAD form) were incorporated into other portions of the training objective. Thus, the observable actions and their job-required standards of performance would be immediately available for evaluation of student learning (Fig. 6).

When the requirement was for the use of certain task-relevant knowledge the details of the knowledge requirement were merely listed (Fig. 7). The relevant job situation was defined from indications of training emphasis, need for or use of job aids, and comments provided by questionnaire respondents and interviewees.



## Training Objective Format for Task Performance

### General Requirements

The student is able to perform the procedural steps of Task X under normal job conditions with no special speed or accuracy requirements.

### Job Situation

Normal job conditions are:

1. ....
2. ....
3. ....
- etc.

### Details of Performance Requirement

Task procedure is:

Occasion for Each Action	Proper Sequence of Actions	Indicators of Adequate Performance
.....	1. ....	.....
.....	2. ....	.....
.....	3. ....	.....

Figure 6

Examples of a training objective prepared for each of the two formats are contained in Appendices F and G.

The development of standardized formats and of standard sentences for general performance requirements, and the direct use of Detailed Activity Descriptions eased the task of preparing the statements of training objectives. Another helpful feature was the fact that the same analysts prepared the DADs and the statements. They thus gained sufficient knowledge of the task to transfer all the necessary data into a training objective, and to rephrase it as appropriate to achieve a clear and readable statement.

Upon completion by service school analysts, the training objective statements would be submitted to school authorities for final review and approval. Thus, the entire cycle of events would be completed. The more essential training needs at a given time would have been identified, analyzed, and reported.

As time passes these objectives might become obsolete—particularly those identified as a result of questionnaire differences between commanders and incumbents, if revised training on these features had become effective in the interval. Periodically, then, there would be a need to repeat portions of the described procedures to keep the objectives responsive to the needs of the job.

## Training Objective Format for Use of Task Knowledge

### General Requirements

The student is able to recognize when to perform Task Z.

### Job Situation

Job conditions for task performance are:

1. ....
2. ....
3. ....
- etc.

### Details of Knowledge Requirement

Specific occasions for task performance:

1. ....
2. ....
3. ....
4. ....
5. ....
- etc.

Figure 7

## APPLYING THE SAMOFF III METHOD

### Guidance for the Analyst

After the complete set of procedures was developed, a manual of specific how-to-do-it instruction was prepared (24). It incorporates the modified versions for each procedural step, as revised on the basis of experience gained during the research application of experimental procedures to a junior officer job, and was devised for use by Army service school personnel in applying the SAMOFF III procedures. The outline in Figure 1 reflects the basic steps in this final version.

To facilitate the obtaining and recording of information for job and task descriptions (Phases A and D), a number of additional aids for use by analysts were incorporated in the manual of instruction. These include:

- (1) Specific questions suggested for use in interview probing of knowledgeable officers.
- (2) Examples from descriptions of Fire Control Platoon Leader Tasks.
- (3) Discussions of various possibilities that might arise.
- (4) Interview procedures to identify and resolve discrepancies from various sources.

The two questionnaire phases (Phases B and C) require comparatively little effort by analysts. Sample instructions, answer sheets, and mailing directions are provided in the manual. Routines are suggested for summarizing and analyzing the questionnaire data, requiring only a few days' effort by clerical personnel.

### Maintenance of Current Objectives

With a minimum of time investment, periodic redeterminations of the general statements of training objectives could be made by readministering the questionnaires of Phases B and C. This procedure would permit rapid review of objectives to assure that they remained responsive to current needs. When important changes were noted in general performance requirements, only those items would need to be subject to the detailed descriptions of Phase D.

This same minimal process—assuming that a task inventory is available—is all that would be required to verify training objectives that may have been prepared by other means. Goals of an existing training course that had been converted to the form of behavioral training objectives could readily be reviewed to determine whether the objectives still represent the most essential training needs.

Where such facilities are readily available or for large-scale and continuing use of the questionnaire phases, the summarizing and analyzing procedures can be adapted for computer processing and analysis. This would permit economical and rapid evaluation of response trends between several questionnaire administrations, and the use of item analysis techniques as might be desired.

By such means of analysis, along with periodic readministrations of questionnaires, there would be a continued inflow to a school of current information and judgments on which to base decisions about training needs. This recurrent updating of information could also be used to make rapid determinations of the effectiveness of changes to an instructional program, thus providing a valuable tool for a training quality control program.

### Application to New Officer Jobs

The rationale of the SAMOFF III method should also be applicable for forecasting training objectives for officer jobs that will be created by the development of new weapon systems. It contains a structure into which job information can be fitted as it becomes available. Advance information about task requirements could be obtained from the system specifications and anticipated operations, and from system designers and developers (25). Portions of the new job that are closely related to tasks in existing jobs might be evaluated by examining the relevant elements of the present jobs. Training needs could be anticipated by these means and continually revised as more information on actual job performance requirements became available.

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AND  
APPENDICES**

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**Appendix A**

**QUESTIONS, RESPONSE CATEGORIES,  
AND PERCENT OF RESPONSE CATEGORY USE**

Table A-1

**Actual Frequency of Performance**

Question	Percent of Response Category Use (Incumbents; Mailed JAQ)
1. During the last few months in your present job position as (job assignee), about <i>how often</i> have you been performing each activity?	
2. Frequency categories are:	
O- <i>Never</i> performed the activity, and <i>do not expect to do so</i> during the next six months.	8
O+ <i>Never</i> performed the activity, but <i>expect to do so</i> within the next six months in this job position.	13
1Y Perform the activity one or more times a <i>year</i> , or since having this position assignment (but <i>not</i> as often as once a month).	12
1M Perform the activity one or more times a <i>month</i> on the average (but <i>not</i> as often as once a week).	28
1W Perform the activity one or more times a <i>week</i> on the average (but <i>not</i> as often as once a day).	23
1D Perform the activity once a <i>day</i> on the average.	12
D+ Perform the activity several times each work day.	4

Table A-2

**Desired Frequency of Performance**

Question	Percent of Response Category Use (Commanders; Mailed JAQ)
1. From your experience as a (unit) commander, judge about <i>how often</i> the (job assignee) should perform each activity. Base this judgment not only on what you feel would be the most desirable frequency of performance, but also on what it is reasonable to expect him to do.	
2. Frequency categories are:	
O- <i>Never</i> should perform the activity.	2
O+ Normally should <i>never</i> perform the activity, but <i>might</i> do so in an unusual situation.	6

(Continued)

Table A-2 (Continued)

## Desired Frequency of Performance

Question	Percent of Response Category Use (Commanders; Mailed JAQ)
1Y Should perform the activity one or more times a year on the average (but <i>not</i> as often as once a month).	12
1M Should perform the activity one or more times a month on the average (but <i>not</i> as often as once a week).	30
1W Should perform the activity one or more times a week on the average (but <i>not</i> as often as once a day).	25
1D Should perform the activity once a day on the average.	17
D+ Should perform the activity several times each work day.	7

Table A-3

## Activity Importance

Question	Percent of Response Category Use			
	Mailed JAQ		Nonmailed JAQ	
	Incumbents	Commanders	Incumbents	Commanders
1. Based on your experience in ( . . . ) units, what <i>degree of importance</i> would you assign to each activity performed by a (job assignee) in regard to its contribution to effective unit operation?				
2. Importance categories are:				
H High Importance	40	43	34	52
M Moderate Importance	33	34	41	34
L Low Importance	21	18	22	10
O Not an activity of (job position)	6	5	2	4
Use the category "High Importance" if you consider the activity to be an <i>essential</i> component of the (job position), in that its performance by the (job assignee) decisively influences unit effectiveness.				
Use the category "Moderate Importance" if you consider the activity to be an <i>important</i> , but not <i>essential</i> , component of the job, in that its performance by the (job assignee) materially, but not decisively, influences unit effectiveness.				
Use the category "Low Importance" if you consider the activity to be a <i>relatively unimportant</i> component of the job, in that its performance by the (job assignee) does not materially influence unit effectiveness.				
Use the category "Not an activity of (job assignee)" if the activity is not a part of the (job position) <i>as you know it</i> .				



Table A-4

## Learning Location

Question	Percent of Response Category Use			
	Mailed JAQ		Nonmailed JAQ	
	Incumbents	Commanders	Incumbents	Commanders
1. From your experience in a (. . .) unit, <i>where</i> would you judge that the <i>main effort should be made</i> by a (job assignee) to learn what he needs to know about each activity. This judgment should take into consideration where it is most useful, most feasible, and most practical for such learning to occur, under the circumstances in which the Army must operate. Do not let your judgment be overly influenced by the location or nature of such training as you may have received. Rather, judge where the training would <i>best</i> be accomplished for future (job assignees).				
2. Location categories are: (for training of newly commissioned officers)				
P Prior to commissioning (such as ROTC, OCS, or USMA).	11	11	10	15
A At the (. . .) School, prior to assignment to a (. . .) unit.	20	28	38	18
S On site (such as job experience, on-the-job training, self-training, or local courses after assignment to a unit).	64	55	48	62
O Other: (Write in).	0	1	0	1
N There is nothing that new (job assignees) need to learn about the activity.	5	4	3	4

Table A-5

## Time to Qualify

Question	Percent of Response Category Use (Commanders; Mailed JAQ)
1. By your standards as a (unit) commander, <i>when</i> do you expect that a new (job assignee) should be <i>capable</i> of satisfactorily performing each of the activities? That is, <i>how soon</i> after an officer <i>assumes</i> the responsibilities of (the job assignment) do you feel he should be able to do each activity with reasonable competency?	
2. Time categories are:	
W Within the <i>first week</i> on the job.	12
M Within the <i>first month</i> on the job (but <i>not necessarily</i> within the first week).	33
3M Within the <i>first three months</i> on the job (but <i>not necessarily</i> within the first month).	30

(Continued)

Table A-5 (Continued)

## Time to Qualify

Question	Percent of Response Category Use (Commanders; Mailed JAQ)
2. Time categories are: (Continued)	
6M Within the <i>first six months</i> on the job (but <i>not</i> necessarily within the first three months).	16
Y Within the <i>first year</i> on the job (but <i>not</i> necessarily within the first six months).	5
3Y Within the <i>first three years</i> on the job (but <i>not</i> necessarily within the first year).	1
O <i>Never necessary for the (job assignment).</i>	2

Table A-6

## Possible to Improve Procedures

Question	Percent of Response Category Use			
	Mailed JAQ		Nonmailed JAQ	
	Checked Yes	Methods for Improvement	Checked Yes	Methods for Improvement
1. From your experience as a (unit) commander, do you feel that for some activities of the (job assignee) there <i>could be a better or more effective way of doing them?</i> That is, could an improvement be made on the present way in which (job assignees) do an activity? If you feel that an <i>improvement is possible for an activity</i> , then <i>also</i> indicate in what manner you feel an improvement might be made.	16		13	
2. Manner categories are:				
H Provide a readable, ready-reference handbook or similar guide for use on the job (Example: DA PAM 27-10, <i>Military Justice Handbook</i> ).		30		37
D Expand, correct, or clarify the existing directives on the matter.		5		7
T Improve the content of school training.		55		48
R Provide research or special study for improving the present methods or procedures.		2		3
? I don't know how it might be improved, but I think it can.		6		4
O Other: (Write in)		2		1

Table A-7

**Poorly Performed Activity**

Question	Percent of Response Category Use			
	Mailed JAQ		Nonmailed JAQ	
	Checked Yes	Methods for Improvement	Checked Yes	Methods for Improvement
1. From your experience as a (unit) commander, do you feel that <i>many</i> (job assignees) perform certain of their activities poorly or unsatisfactorily, <i>even after a reasonable amount of time on the job</i> ? If you feel that an activity is usually not done by <i>experienced</i> (job assignees) as well as it could be, then <i>also</i> indicate the most likely reason for such performance of that activity.	11		7	
2. Reason categories are:				
I Lack of interest or poor attitude on the part of (job assignees).		15		16
T Ineffective school training on the matter.		35		23
M (Job assignees) are overburdened with more important matters, and do not have time to properly perform this activity.		33		14
D The activity is an extremely difficult one to master.		4		11
? I don't know the reason, but I believe the general performance by many (job assignees) is poor or unsatisfactory.		4		17
O Other: (Write in)		9		19

Table A-8

Time to First Performance<sup>a</sup>

Question	Percent of Response Category Use <sup>b</sup> (Incumbents; Mailed JAQ)
1. Thinking back to when you <i>first</i> took over the job of (. . .), in any (. . .) unit, <i>when</i> did you <i>first perform</i> each of the activities?	
2. Time categories are:	
W First performed the activity during the <i>first week</i> on the job as (job assignee).	11
M First performed during the <i>first month</i> on the job (but <i>not</i> within the first week).	31
3M First performed during the <i>first three months</i> on the job (but <i>not</i> within the first month).	25
6M First performed during the <i>first six months</i> on the job (but <i>not</i> within the first three months).	10
Y First performed during the <i>first year</i> on the job (but <i>not</i> within the first six months).	1
3Y First performed during the <i>first three years</i> on the job (but <i>not</i> within the first year).	0
O Have <i>never</i> performed the activity while in the job of (. . .).	21

<sup>a</sup>This question was eliminated from the final version of the JAQ.<sup>b</sup>Using only respondents with less than six months' job experience.

## Appendix B

### FINAL SELECTION RULES

**FIRST PHASE:** Reject activity from further training consideration on basis of Rule 1, 2, 3, or 4.<sup>1</sup>

Rule 1: The activity is performed less often than once a month, competent performance is not required within the first two months on the job, and the activity is not judged at least moderately high in importance by commanders.

Rule 2: Less than half of the incumbents do the activity, and less than half of the commanders feel they should do it.

Rule 3: Commanders and job incumbents generally agree that the activity is of low importance.

Rule 4: There is no indication that the activity is at least of moderate importance.

**SECOND PHASE:** Of those remaining after first phase, select activity for definite training consideration on basis of Rule 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, or 18. (Rules 5-8 deal with response differences between incumbents and commanders; Rules 9 and 14-18 identify performance problem areas; Rules 10-13 are concerned with agreement between groups on the usefulness of school training for essential tasks.)

Rule 5: The activity is performed by job incumbents with a frequency that is considerably different from that desired by commanders (e.g., once a week vs. once a year).

Rule 6: Considerably fewer job incumbents have performed the activity than should, or, conversely, considerably more have performed it than should (e.g., less than half vs. over 85%).

Rule 7: Judgments of the importance of an activity differ considerably between commanders and job incumbents (e.g., moderate vs. very high).

Rule 8: There is indecisive group judgment by job incumbents of activity importance, when commanders judge it to be of high importance.

Rule 9: Over 85% of the job incumbents may be expected to perform the activity, and there are definite indications of existing learning difficulties (as evidenced by at least 10% response on both the questions of Procedure Improvement and of Performance Improvement by commander groups).

Rule 10: Commanders and job incumbents generally agree that the activity is of high importance, and that the learning of that activity should occur during the formal school course.

<sup>1</sup>Precise summary values are associated with each rule, but only a verbal representation of the rule is presented here.

Rule 11: The activity is done, and should be done, more frequently than once a week by over 85% of the job incumbents, and it is generally agreed that the learning of that activity should occur during the formal school course.

Rule 12: Commanders indicate that the activity is of high importance, that they require competent performance within the first month after job assignment, and that learning of that activity should occur during the formal school course.

Rule 13: Commanders indicate that the activity is of high importance, that they require competent performance within the first month after job assignment, and there is some agreement between commanders and job incumbents that the learning of that activity should occur during the formal school course.

Rule 14: Competent performance of a high-importance activity is required within the first three or four months after job assignment, and over 20% of the commanders state that performance even by experienced job incumbents is less than satisfactory.

Rule 15: Competent performance of a high-importance activity is required within the first month after job assignment, and 10 to 20% of the commanders state that performance even by experienced job incumbents is less than satisfactory.

Rule 16: There is agreement that the activity is at least of moderately high importance, a number of officers suggest the formal school course as the location for learning, and over 20% of the commanders state that procedure improvement is possible (with "improvement of the content of school training" as the means usually suggested for such improvement).

Rule 17: There is agreement that the activity is of high importance, a number of officers suggest the formal school course as the location for learning, and 10 to 20% of the commanders state that procedure improvement is possible (with "improvement of the content of school training" as the means usually suggested for such improvement).

Rule 18: The activity has been performed by over 85% of the job incumbents, a number of officers suggest the formal school course as the location for learning, and over 20% of the commanders state that procedure improvement is possible (with "improvement of the content of school training" as the means usually suggested for such improvement).

**THIRD PHASE:** Of those remaining after first and second phases, reject activity from further training consideration on basis of Rule 19, 20, or 21.

Rule 19: Commanders and job incumbents generally agree that the learning of the activity should be accomplished prior to attendance at the formal school course (e.g., ROTC or USMA).

Rule 20: Commanders and job incumbents agree that the learning location should be on the job, after attendance at the formal school course, and competent performance is not expected by commanders for at least three months after job assignment.

Rule 21: The activity is performed at least monthly by over 85% of the job incumbents, there is no indication that training or performance procedures can be improved or that performance by experienced job incumbents is less than satisfactory, and there is no suggestion that learning should occur during the formal school course.

Table B-1

**Number of Times Each Selection Rule Applied**

Phase	Number of Rule Applications	
	Rejected	Selected
<b>First Phase</b>		
Rule 1	14	
Rule 2	10	
Rule 3	120	
Rule 4	24	
Total	168	
<b>Second Phase</b>		
Rule 5		3
Rule 6		12
Rule 7		16
Rule 8		14
Rule 9		19
Rule 10		27
Rule 11		11
Rule 12		17
Rule 13		10
Rule 14		5
Rule 15		5
Rule 16		26
Rule 17		2
Rule 18		36
Total		203
<b>Third Phase</b>		
Rule 19	22	
Rule 20	70	
Rule 21	103	
Total	195	

## Appendix C

### 160 GENERAL TRAINING OBJECTIVES FOR THE NIKE HERCULES FIRE CONTROL PLATOON LEADER (Feb 62)

#### Key to Letters Representing General Performance Requirements:

- D - The student is able to do the activity under normal conditions, though with no special accuracy or speed requirements.
- S<sup>1</sup> - The student is able to do the activity under normal job conditions, within prescribed accuracy and/or speed requirements.
- U - The student is able to do the activity under unusual or emergency conditions that are likely to occur in actual job performance, though with no special accuracy or speed requirements.
- W - The student is able to recognize when to perform the activity.
- T - The student is able to detect discrepancies from prescribed standards and tolerances.
- E - The student is able to recognize the effects that performance of the activity will be likely to have upon the equipment, the system, or other persons (as appropriate).
- L - The student is able to recognize the location and/or nomenclature (as appropriate) of items with which the activity is concerned.
- R - The student is able to recognize what reference sources and/or directives are pertinent to performance of the activity by the officer.
- P - The student is able to recognize those job purposes that may be served by the officer's performance of the activity.

<u>Listed Item</u>	<u>Job Activity</u>	<u>General Behavior Requirement</u>										
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>		
1	Serve as Battery Control Officer (BCO) during a normal 15-minute alert crew drill.		S	U								
3	Serve as BCO during an operational readiness evaluation (ORE) of the fire unit.		S	U		T						
9	Serve as BCO during a simulated CBR attack (with use of protective masks).											P

<sup>1</sup>Includes requirement for either speed or accuracy, since these categories were not separated on the experimental Training Emphasis question.



Listed Item	Job Activity	General Behavior Requirement									
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>	
11	Serve as BCO during fire unit low altitude acquisition radar search.									P	
14	Serve as BCO during operation against high-intensity ECM.		S	U							
15	Serve as BCO during operation against special or unusual types of targets.		S								
22	Serve as BCO with a "minimum manning" crew (where the BCO also serves as the Early Warning Plotting Board Operator).		S							P	
27	Serve as BCO with inoperative battery acquisition radar and only manual communications with AADCP.									P	
28	Serve as BCO with loss of inter-area cable communications between Fire Control and Launcher areas.		S	U							
29	Serve as BCO with Launcher Control Station (LCS) out of action.		S	U							
30	Serve as BCO during training with the AN/MPQ-36 Target Simulator.		S								
32	Serve as Fire Unit Identification Officer.									P	
36	Determine the authenticity of a voice communication.		S		W					P	
37	Determine what is the current mode of operations for the fire unit.									P	
39	Determine whether to voice an objection to an ORE inspector with regard to the way an operator set up a check during ORE.									P	
40	Determine when to direct the alert crew to don their protective masks.									P	
41	Determine the proper target for selection and engagement by the fire unit.		S								
42	Determine the maneuvering, raid size, and other characteristics of a target.		S								
43	Determine the identity of a target, whether friend or foe.		S								

Listed Item	Job Activity	General Behavior Requirement										
		D	S	U	W	T	E	L	R	P		
44	Determine the presence of a target on the PPI during employment of ECM.		S									
45	Determine the proper missile-mission combination to be used for an engagement.		S									
46	Determine the nature of target damage.		S			T						
47	Determine whether to continue an engagement of a target or to seek a new target.		S		W							
48	Determine when to report the fire unit as nonoperational.		S		W	T						
49	Determine the true target altitude of a low altitude track.		S			T						
52	Perform (or observe the appropriate LINE VOLTS meter for the results of) the Director Station, or the TTR and MTR system, <u>primary power checks.</u>	D				T						
56	Observe the <u>PARALLAX, HEIGHT-OF-SITE, BURST-TIME BIAS, or GYRO AZIMUTH 100's MILS settings</u> at the computer control panel to determine that they read at values prescribed for the fire unit.						T					
57	Observe the <u>BATTERY CODE switch setting</u> in the radar coder set group to determine that it is in the position established for the fire unit.						T		L			
58	Analyze the <u>data recorder tape</u> to determine battery readiness and performance; or to detect and evaluate discrepancies on actual firings, practice engagements, computer dynamics tests, or simultaneous tracking tests.	D				T						
59	Confer with fire control technicians on <u>data recorder tape evaluation discrepancies</u>						T	E				
60	Observe the ACCELERATION, VELOCITY, and POSITION DIFFERENCE meters on the computer control panel for results of the <u>parallel tracking antenna points test (parallel antenna data check).</u>						T	E				

<u>Listed Item</u>	<u>Job Activity</u>	<u>General Behavior Requirement</u>										
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>		
61	Observe the ACCELERATION, VELOCITY, and POSITION DIFFERENCE meters on the computer control panel for results of the <u>orient check</u> .					T						
62	Observe the recording galvanometer and calibrate traces for results of the <u>data recorder check (multi-channel data recorder galvanometer zero and calibrate checks)</u> .					T						
63	Receive reports on, and compute results of, the <u>gyro azimuth transmission check</u> .	D				T						
64	Observe the horizontal plotting board track and the ACCELERATION, VELOCITY, and POSITION DIFFERENCE meters on the servo computer assembly, and compute results of, the <u>simultaneous tracking test</u> .	D				T						
65	Listen to (and/or observe) the conduct of the <u>command calibration (missiles acquire and command check)</u> .	D				T						
66	Observe the results of the PI <u>electronic cross orientation (or electronic circle orientation)</u> .	D				T		L				
67	Observe, and receive reports on, the results of the <u>acquisition system acquire check</u> .					T						
68	Listen to the conduct of the test responder (flight simulator group) <u>acquire and command test (command transmission check)</u> .					T						
69	Participate in the conduct of a <u>computer dynamics course check</u> .	D				T						
70	Observe (and/or time) selected portions of a <u>computer dynamics course check</u> .	D				T						
71	Perform (or observe the MAG FREQ and REC NOISE meters for the results of) the <u>acquisition receiver sensitivity check</u> .	D				T						

Listed Item	Job Activity	General Behavior Requirement									
		D	S	U	W	T	E	L	R	P	
72	Perform (or observe the PPI for the results of) the <u>interference suppressor check</u> .	D				T					
73	Perform (or observe the plotting boards for the results of) the <u>ORE plotting boards check</u> .	D				T				P	
74	Perform (or observe the PPI and PI for results of) the basic <u>moving target indicator (MTI) check</u> .	D				T		L			
77	Observe the PPI and PI for results of the <u>acquisition presentation check</u> .	D				T					
78	Observe the TTR range pot at the radar set group, and compute results of the <u>target radar range zero check</u> .					T					
79	Observe the MTR range pot at the radar set group, and compute results of the <u>missile radar range zero check</u> with use of response time.					T					
80	Observe the tracking radar AZIMUTH and ELEVATION ERROR meters for results of the <u>tracking radar angle sensitivity checks</u> .					T		L			
81	Observe the SIGNAL LEVEL dial settings, and compute the results of the <u>tracking radar receiver sensitivity checks</u> .					T		L			
86	Perform (or observe the MTR range indicator scope, and compute the results of) the <u>MTR code spacing check (coding interval check)</u> .					T					
87	Observe the PPI for results of the <u>FUIF back-to-back loop check</u> .					T				P	
88	Perform (or observe the PPI for results of) the <u>FUIF marks check</u> .					T				P	
91	Observe the selected items on system Check Sheets for the results of various checks in order to determine the adequacy of equipment operation without personally performing or observing the selected check.					T			R		

Listed Item	Job Activity	General Behavior Requirement									
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>	
92	Receive a report from IFC maintenance or operator personnel on the operational status of equipment, including malfunctions found and actions taken to return equipment to operational status.									P	
93	Receive a report on the operational status of launcher equipment from the Launcher Area, including malfunctions and actions taken to return equipment to operational status.									P	
95	Review forms, records, and/or unit reports of equipment operation, system or equipment checks, and/or equipment status for accuracy, timeliness of entries, or other indicators of proper execution.									P	
98	Determine the acceptability of a target for the simultaneous tracking test during an ORE.	D				T					
99	Prepare (and/or submit) reports pertaining to equipment operation or fire unit status.	D			W	T			R	P	
101	Direct subordinate personnel to correct (or inform them of) operational discrepancies.									P	
150	Review forms, records, and/or reports of equipment maintenance or status for accuracy and timeliness of execution.					T				P	
151	Observe whether required maintenance manuals, orders, bulletins, SOPs and other directives and publications are available to the men who need them.									P	
153	Prepare and/or submit reports pertaining to equipment maintenance.									P	
168	Compare the entries on stock record cards for agreement with inventory count.									P	
169	Observe the location, protection, and/or identification of stored spare parts on hand.									P	

Listed Item	Job Activity	General Behavior Requirement									
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>	
180	Determine whether all required supply publications, and current changes, are on hand or requisitioned.									P	
186	Determine the available facts about a lost, damaged, or destroyed property item.									P	
199	Report the available facts regarding lost, damaged, or destroyed property to the Battery Commander and/or the Battery Property Book Officer.									P	
201	Expedite the receipt of requisitioned items or of items immediately needed to keep the tactical equipment operational.									P	
202	Direct (or grant authorization to) a platoon member to expedite the receipt of requisitioned or immediately needed items.									P	
203	Inform the Battery Commander, or other pertinent authority, of the results of a property inventory.									P	
249	Receive formal job instruction or refresher training in some aspect of the officer job.									P	
268	Determine whether an attempt to repair equipment has been made by unqualified personnel, or whether improper or inadequate tools and equipment have been used for repairs.						T	E		P	
271	Prepare or indorse an evaluation report on a platoon enlisted person.	D				T			R		
272	Assign an efficiency rating for a platoon enlisted person, for recording on his DA Form 24 "Service Record."	D				T			R		
276	Direct a subordinate supervisor to provide certain job instruction and/or guidance for a platoon member or crew.									P	
278	Inform the Battery Commander of the availability and qualification of a platoon member to receive job training outside the unit.									P	

<u>Listed Item</u>	<u>Job Activity</u>	<u>General Behavior Requirement</u>										
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>		
300	Question an individual platoon member on matters pertaining to discipline, welfare, or morale.									P		
318	Determine whether platoon living conditions meet standards of sanitation, health, and military requirements.									P		
339	Inform the Battery Commander of the occurrence and/or circumstances concerning a civil offense committed by a platoon member.									P		
353	Determine whether equipment and vehicle operators in platoon are properly licensed.									P		
354	Determine the facts and circumstances concerning an accident, fire, storm damage, unsafe condition, or other safety incident involving the platoon area, equipment, or personnel.									P		
357	Inform a platoon member of an unsafe practice.									P		
359	Instruct or demonstrate proper safe practice or first aid treatment.	D				T			R			
360	Inform platoon members of proper safety regulations and precautions.									P		
361	Assist, direct, or administer first aid of personnel injuries.									P		
364	Submit a report of facts and circumstances regarding an accident, fire, storm damage, unsafe condition, or other safety incident in the platoon area or involving platoon personnel to the Battery Commander, appropriate higher headquarters, Investigating Officer, Claims Officer, or other authorized person.									P		
372	Recommend to the Battery Commander punishment, administrative measures, or other disciplinary action for violations of safety procedures or for traffic offenses by a platoon member.									P		

<u>Listed Item</u>	<u>Job Activity</u>	<u>General Behavior Requirement</u>								
		<u>D</u>	<u>S</u>	<u>U</u>	<u>W</u>	<u>T</u>	<u>E</u>	<u>L</u>	<u>R</u>	<u>P</u>
376	Review the platoon guard roster for information on guard assignments.									P
377	Observe the perimeter of the area security fence for breaks, openings under the fence, or undesirable material close to fence or in fire lane.									P
379	Observe the performance of platoon personnel for compliance with security requirements (including communication security).									P
388	Determine the facts and circumstances regarding a security incident involving personnel, materiel accidents, or subversive activity.									P
389	Determine whether there is adequate compliance with communication security procedures and precautions.					T			R	
390	Direct platoon personnel to repair the security fence, or to clear the fence area of undesirable material.									P
392	Receive and acknowledge the receipt of classified documents.	D							R	
394	Instruct platoon personnel on the need for, and manner of, complying with security requirements (including communication security).	D					E		R	
396	Destroy classified documents.									P
398	Prepare plans for the ground defense of the platoon area.								R	
445	Serve as a member of a Court-Martial.	D							R	
447	Serve as Defense Counsel or Assistant Defense Counsel.	D							R	
452	Serve as Trial Counsel or Assistant Trial Counsel.	D							R	



# Appendix D

## DESCRIPTION OF A SEQUENTIAL PROCEDURE

### Activity Description Form

Position or Job: N-H Fire Control Platoon Leader Page 1 of 4 Pages

Responsibility Area: II. Operational readiness of the fire control equipment.

Responsibility Function: (check one): ☒ Information Gathering ☐ Determination ☐ Controlling Activity

Specific Activity: II.P. Receive reports on, and compute results of, the gyro azimuth transmission check.

Identifying Factors: Normal performance.

Technical References: <u>TM 9-1430-251-12, Table III, Step 15; TM 9-1430-251-20/1, Para. 64</u>		
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards
<p>About weekly. (P) Check upon adequacy of periodic computer adjustments. (P) Preparatory for an Operational Readiness Evaluation (ORE). (P) Manual portions of the gyro azimuth checks and adjustment procedures for the selected Launching Section have been completed. (M) No conflict with an operational mission requirement. (P) No conflict with an equipment repair being accomplished. (F)</p>	<p>II.P. ....</p>	<p>Determine that the gyro azimuth received by a Launching Section is identical to that being transmitted by the Computer.</p>
		<p><b>Precautions and Comments</b></p> <p>The gyro azimuth (AG) is a value that indicates in mils the direction from the fire unit of the predicted intercept point, which is that point in space at which the computer predicts the missile will intercept the target. This point is continuously being predicted before the missile is launched, and the direction of the intercept point is continuously transmitted to the selected missile before launch. The AG value serves as a reference in controlling the flight of the missile after it is launched. The latest AG value received before launch determines the instructions for the missile to automatically head in the direction of the predicted intercept point soon after launch.</p> <p>The Launcher azimuth (AL) is commonly called "Launcher heading," and represents the direction of the Launcher emplacement.</p>

Activity: II.P.		Function: IG	Position: FCPL (N-H)	Page 2 of 4 Pages	
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments		
Standing in front of Battery Control Console. (P)	1. Directs the Computer Operator to set up the AG transmission check for one Launching Section.	Communications are established with the Launching Control Console Operator, verification is made that the manual portions of the gyro azimuth checks and adjustment procedures for a selected Launching Section have been completed and a launcher designated. Computer is energized, and conditioned for COMPUTER-TEST.			
Prior to operator's setting of GYRO AZIMUTH 100's MILS switch, after computer is energized as indicated by illumination of ACTION indicator light. (P)	2. Observes illumination of TARGET TRACKED indicator lamps.	No target is being tracked (to prevent accidental firing of the missile), as indicated by illumination of IVORY instead of GREEN TARGET TRACKED lamp.	Indicator lights located on Battery Signal Panel Indicator.		
Prior to operator's setting of GYRO AZIMUTH 100's MILS switch, after computer is energized as indicated by illumination of ACTION indicator light. (P)	3. Observes position of Computer CONDITION switch.	Computer is conditioned for test, as indicated by Computer CONDITION switch setting to STAND BY.	Switch located on Computer Control Panel (Figure 84, TM 9-1430-250-10)		
Computer Operator positions GYRO AZIMUTH 100's MILS switch to 20, and announces GYRO AZIMUTH dial reading (in mils). (M)	4. Obtains GYRO AZIMUTH dial reading.	Reading is between 1995 and 2005 mils, when switch is set at 20, indicating the gyro azimuth being transmitted to Launching Section.	Switch is routinely first set at 20 by Computer Operator.		
(Usual action)	4.a. Listens as Computer Operator announces the reading.	Reading obtained in mils.			
(Optional action)	4.b. Observes reading on GYRO AZIMUTH dial.	Reading obtained in mils, interpolated from dial increments of 5 mils.	Dial viewed through the lower left hole in the double doors of the Servo Computer Cabinet, below the Computer Control Panel. (Figure 85, TM 9-1430-250-10)		

Activity: II.P.		Function: IG	Position: FCFL (N-H)	Page 3 of 4 Pages
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments	
(Optional action)	4.c. Observes reading on GYRO AZIMUTH REPEATER dial.	Reading obtained in mils, interpolated from dial increments of 50 mils.	Dial located on Tactical Control Indicator of Battery Control Console.  Less accurate than other two actions.	
Computer Operator announces Launcher heading (in mils). (M)	5. Obtains Launcher heading, or azimuth, from Computer Operator.	Heading obtained in mils.	Generally the Launcher heading (AL) is recorded for each Launching Section and known to the Computer Operator. However, it may be obtained from each Launching Section Operator, who reads the value of the $\Delta_L$ RESOLVER setting for the selected Launcher.	
Computer Operator obtains DATA CONVERTER dial reading (in mils) from Launching Section Operator, and announces it. (M)	6. Obtains DATA CONVERTER dial reading from Computer Operator.	Reading obtained in mils.		
AG, AL, and DATA CONVERTER readings known in mils for designated Launcher. (P)	7. Computes number of mils difference between transmitted and received gyro azimuth.	Difference is $\pm 25$ mils or less, indicating satisfactory reception by the Launching Section of the transmitted gyro azimuth.	Tolerance of $\pm 25$ mils is relatively large, since the missile course will also be corrected during flight.	
(Usual action)	7.a. Subtracts the Launcher heading value from gyro azimuth reading, and compares the difference with DATA CONVERTER dial reading.	$AG - AL = DATA CONVERTER$ dial reading, within a tolerance of $\pm 25$ mils. (Step 4 - Step 5 = Step 6)	NOTE: When the gyro azimuth is less than the Launcher heading, adjust the AG value by adding 6400 mils before subtracting the AL value from it.	
(Optional action)	7.b. Adds the Launcher heading value to the DATA CONVERTER dial reading, and compares the sum with the gyro azimuth reading.	$AL + DATA CONVERTER$ dial reading = AG, within a tolerance of $\pm 25$ mils. (Step 5 + Step 6 = Step 4)	NOTE: When the sum of AL and DATA CONVERTER dial reading is greater than 6400, adjust the sum value by subtracting 6400 mils, and then compare with the AG.	

Activity: <u>II.P.</u>	Function: <u>IG</u>	Position: <u>FCPL (N-H)</u>	Page <u>4</u> of <u>4</u> Pages
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments
As desired for more complete check of other AG transmissions to same Launching Section. (P)	8. Directs the Computer Operator to set the GYRO AZIMUTH 100's MILS switch to another position for same Launcher, obtains GYRO AZIMUTH dial reading. (Repeats Steps 5, 6, and 7.)	Tolerance of $\pm 25$ mils is same for all AG transmission to Launching Section.	Switch settings are arbitrary, but 20 is used in the TM's as the first setting. Other possible settings are 4, 12, 28, 36, 44, 52, and 60. Settings of 20, 36, and 52 are the ones listed on the ORE Check Sheet. Multiply each setting by 100 to obtain the value in mils of gyro azimuth.
Completion of check in one Launching Section, and as desired for check of AG transmission to another Launching Section. (P)	9. Directs the Computer Operator to inform Launching Control Console Operator to select another Launching Section, and to inform previous Launching Section Operator to restore his equipment to the positions existing before the check commenced.	Another Launching Section is prepared for the check, and a Launcher designated.	
	10. (Repeats Steps 4, 5, 6, 7, and 8.)	Tolerance of $\pm 25$ mils is same for all AG transmission to Launching Section.	
Completion of check. (M)	11. Directs the Computer Operator to restore his equipment to the positions existing before the check commenced, and to inform the Launching Section Operator and Launching Control Console Operator to do the same.	Equipment is returned to status existing at beginning of check.	

# Appendix E

## DESCRIPTION OF A VARIABLE PROCEDURE

### Activity Description Form

Page 1 of 8 Pages

<b>Position or Job:</b>	N-H Fire Control Platoon Leader		
<b>Responsibility Area:</b>	VII. Job training of platoon personnel.		
<b>Responsibility Function:</b>	(Check one): <input checked="" type="checkbox"/> Information Gathering <input type="checkbox"/> Determination <input type="checkbox"/> Controlling Activity		
<b>Specific Activity:</b>	VII.A. Observe the manner in which an individual platoon member performs selected activities of his job or job-training assignment.		
<b>Identifying Factors:</b>	Normal performance.		
<b>Technical References:</b>	Technical Manuals and directives pertinent to selected job activity of subordinate.		
<b>Indications Prior to Performance</b>	<b>Procedural Steps or Actions</b>	<b>Specific Determinations, Goals, or Standards</b>	<b>Precautions and Comments</b>
Daily, more or less continually in an informal manner as the opportunity occurs. (P) Prior to assigning a radar operator to a regular crew position. (M) Soon after an indication is received that something is wrong with overall performance of an alert crew, but not certain what or who is at fault. (M) Soon after an indication is received that something is wrong with a particular job performance of an individual, but not certain what is at fault. (M) Information on performance ability is needed for completing evaluation reports or for making promotion recommendations. (P) Information on performance ability is needed to select a man for a vacant job position, or for an anticipated job vacancy. (P) Desire for follow-up action on prior job directions given an individual. (P) Desire to learn how an activity is performed, for self-training. (P) Soon after receipt of an indication or report that a job trainee is not progressing satisfactorily. (P)	VII.A. ....	Supply own knowledge, not just word of subordinate regarding an individual's performance.  Determinations Served (Information provided for): 1. Determine the previous job experience and/or training of an individual platoon member. 2. Determine the present level of an individual platoon member's overall proficiency in a job position. 3. Determine the present level of an individual platoon member's job capability in selected job areas or activities. 4. Determine the adequacy of job instruction content within the platoon. 5. Determine the adequacy of methods of job instruction within the platoon. 6. Determine an individual platoon member's readiness to receive additional job training and/or experience. 7. Determine the need for particular crew drills. 8. Determine when a particular crew drill is to be carried out, and in what manner.	Emphasis may be on: a. End results of performance. b. Methods used by the individual. c. Behavior and attitude during performance.  There is no implication that performance of this activity is sufficient by itself to provide all information that may be needed to make any one of the determinations adequately.

Activity: VII.A.		Function: IG	Position: N-H FCPL	Page 2 of 8 Pages	
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments		
When formally perform the observation. (P)	1. Selects the person and job activity to observe as well as the time, place, and method of observation.	<p>9. Determine the rate of learning progress being made by a job trainee.</p> <p>10. Determine how to perform the officer's job-training activities (self-training).</p> <p>11. Determine the nature of platoon job training to be assigned to, or provided for, individual platoon members.</p> <p>12. Determine how well a platoon member actually did perform an activity or job, in comparison with how well he could have done it.</p> <p>13. Determine whether poor work performance of a platoon member is due to a lack of ability to do better, or due to inadequate motivation.</p> <p>14. Determine the degree to which a platoon NCO (or potential NCO) can successfully accept responsibility.</p> <p>15. Determine the occurrence of improper, careless, or negligent use or operation of materiel.</p>	<p>Persons to observe may be of the following types:</p> <ol style="list-style-type: none"> <li>1. Radar operator trainees.</li> <li>2. Radar operators.</li> <li>3. Generator operators.</li> <li>4. Radar technicians.</li> <li>5. Parts supply specialist.</li> <li>6. Platoon NCOs &amp; warranters.</li> <li>7. Instructors of trainees.</li> <li>8. Area guards.</li> <li>9. Any special personnel assigned to platoon.</li> </ol> <p>Activities to observe may be of the following types:</p> <ol style="list-style-type: none"> <li>a. Operational checks and adjustments.</li> <li>b. Operation of equipment.</li> <li>c. Instruction being given a trainee.</li> <li>d. Supervision being exercised by a platoon supervisor.</li> <li>e. Performance of maintenance, preventive or repair.</li> <li>f. Conduct of recording or communicating tasks.</li> </ol>		

Activity: VII.A. _____		Function: IG	Position: N-H FCPL	Page 3 of 3 Pages	
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments		
When formally perform observation of unfamiliar job activities. (P)	2. Identified specific matters to be observed.	All important points clearly identified in terms of specific job actions or end results to be observed.	NOTE: Generally observe job performance formally as a process of training, not during scheduled equipment checks or as a result of equipment not functioning.		
Need for information on proper performance of the activity, as decided by the officer. (P)	2.a. Reviews applicable portions of Technical Manual or other directives pertinent to the activity selected for observation.	Identification of prescribed procedure, sequence, standards, or other important observable matters.	Mode of observation and nature of information desired will largely dictate the specific points to observe.		
Need for identification of important points to be observed, as decided by the officer. (P)	2.b. Consults others for information on what important points should be observed.	Identification of specific actions or aspects of action results that are important indicators of performance ability, training progress, or of whatever information is desired.			
Possibility that some important points to observe may be overlooked or forgotten, as decided by the officer. (P)	2.c. Prepares checklist or other aid identifying matters to be observed.	Activity broken down into specific actions or results to be observed, and recorded sufficiently to permit recall by the officer during observation.	May include matters based upon previous knowledge or experience with the activity or individual concerned.		
Activity observed is complex or unfamiliar. (P)			Some organizations or individuals may have previously prepared such aids for some activities. These may be used as desired by the officer.		
When formally perform the observation, at option of the officer. (P)	3. Notifies the individual's immediate supervisor of the occurrence and purpose of the observation.	Prevent misunderstandings on the part of an individual's immediate supervisor.	NOTE: If indications are received that such observation would unduly disrupt unit operations, observation should be postponed until a more favorable time.		
Prior to observation, when supervisor would disrupt the supervisor's work schedule or interfere with work being accomplished. (M)					

Activity: VII. A.	Function: IG	Position: N-H FCPL	Page 4 of 8 Pages
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments
<p>Prior to observation, at option of the officer. (P)</p> <p>When notice of observation permits a more accurate indication of performance capabilities. (P)</p> <p>Length of time between notice and actual observation is at discretion of the officer. (P)</p>	<p>4. Informs the individual concerned of the occurrence and/or purpose of the observation.</p>	<p>Prevent misunderstandings on the part of the observed individual. Individual is forewarned of observation.</p>	
<p>Informally as occasion permits. (P)</p> <p>Formally as planned. (P)</p>	<p>5. Observes the activity performance of the individual, using whatever checklists or aids may have been prepared</p>	<p>Observation is directed and alert to manner of performance, immediate results of performance, or behavior and attitude of individual.</p> <p>Observation of actions serves to provide information for Determination 10 above:</p> <p>Determine how to perform the officer's job training activities (self-training).</p>	<p>Several methods of observation may be employed.</p>
<p>To hear audible actions of crew personnel during drill procedures or conduct of checks and adjustments. (M)</p> <p>To see actions and manner of performance. (M)</p> <p>Usual informal procedure. (P)</p> <p>Desire to avoid appearance of observing. (P)</p> <p>Time is an important factor in the activity performance, as in target transfer. (M)</p>	<p>5. a. Listens in on the COMMAND or TECHNICAL loop, in either the Battery Control Station or Tracking Station.</p> <p>5. b. Stands near individual, watching and listening to his performance.</p> <p>5. c. Sees and hears performance while walking through work area or while primarily attending to other matters.</p> <p>5. d. Times an action with a watch or stopwatch.</p>		<p>Usually listen in van other than one in which observed individual is located, except when officer is serving as Battery Control Officer.</p>



Activity: VII.A.		Function: IG	Position: N-H FCPL	Page 2 of 5 Pages	
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments		
Observation of performance of equipment checks and adjustments, equipment operations, or equipment maintenance. (P)	5.e. Looks at meters, dials, switches, and other equipment indicators of action results or information transmissions.				
During the process of observing activity performance. (M)	c Identifies specific evidence of the following performance factors, as appropriate to the purpose of the observation:	As time and circumstances permit, specific evidence is obtained of: a. Failure to meet prescribed or desired standards of performance or of performance results. b. Outstanding performance or results. c. Personal conduct and/or attitude. d. Causes of inadequate performance. e. Satisfactory performance, results, or attitude. f. Progress of trainee.	Errors detected in performance may be corrected on the spot, or through the usual chain of command, as may be appropriate for the immediate situation.  Outstanding performance should be praised on the spot, through the chain of command, or both.		
	6.a. Errors in sequence of actions. 6.b. Errors in accuracy of actions. 6.c. Errors in timing of actions. 6.d. Errors in omission of actions. 6.e. Errors in using inappropriate or erroneous actions. 6.f. Lack of promptness in taking action. 6.g. Failure to attend to activity.	For sake of brevity, specific determinations that may be served (provide information for) by observing evidence of each performance factor are identified by number only (as listed above):  Serves Determinations 1,2,3,4, 5,6,7,8,9,11,12,15. Serves Determinations 1,2,3,4, 5,6,7,8,9,11,12,15. Serves Determinations 1,2,3,4, 5,6,7,8,9,11,12,15. Serves Determinations 1,2,3,4, 5,6,7,8,9,11,12,14,15. Serves Determinations 1,2,3,4, 5,6,7,8,9,11,12,14,15. Serves Determinations 6,7,8, 11,12,13,14,15. Serves Determinations 6,7,11, 13,14,15.			

Activity: VII.A. Indications Prior to Performance	Function: IG	Position: N-H FCPL	Page 6 of 8 Pages
	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments
	<p>6.h. Performance of inefficient actions.</p> <p>6.i. Performance of inefficient actions.</p> <p>6.j. Personal conduct during performance.</p> <p>6.k. Leadership potential.</p> <p>6.l. Outstanding performance.</p> <p>6.m. Outstanding results of performance.</p> <p>6.n. Knowledge of what was taught.</p> <p>6.o. Ability to use what was taught.</p> <p>6.p. Interest in and/or acceptance of what was taught.</p> <p>6.q. Subordinate-supervisor relationships.</p> <p>6.r. Will to work, pride in work.</p> <p>6.s. Alertness to malfunctions, deviations from standard, or other disruptive influences.</p> <p>6.t. Fluctuations in performance quality.</p> <p>6.u. Inattention to work.</p> <p>6.v. Lack of supervisory support.</p> <p>6.w. Absence of sense of purpose or accomplishment.</p> <p>6.x. Misunderstanding of written or oral communication.</p> <p>6.y. Interference of previous work habits and training.</p> <p>as in transition from NIKE-AJAX to NIKE-HERCULES equipment.</p> <p>6.z. Care of tools and equipment.</p>	<p>Serves Determinations 1,4,6,9,11,13,14,15.</p> <p>Serves Determinations 1,2,3,4,9,11,12,13,15.</p> <p>Serves Determinations 6,12,13,14,15.</p> <p>Serves Determinations 6,11,14.</p> <p>Serves Determinations 1,2,3,4,5,6,7,9,11,12,13,14.</p> <p>Serves Determinations 1,2,3,4,5,6,7,9,11,12,13,14.</p> <p>Serves Determinations 3,5,6,7,8,9,11,13.</p> <p>Serves Determinations 3,4,5,6,7,8,9,12,13,14.</p> <p>Serves Determinations 5,6,9,11,12,13,14.</p> <p>Serves Determinations 2,5,6,11,12,13.</p> <p>Serves Determinations 2,5,6,7,8,11,12,13,14.</p> <p>Serves Determinations 1,2,3,4,6,7,8,9,11,12,13,14,15.</p> <p>Serves Determinations 3,5,6,7,8,9,11,12,13,14,15.</p> <p>Serves Determinations 2,3,11,12,13,14.</p> <p>Serves Determinations 5,9,12,13.</p> <p>Serves Determinations 5,11,12,13,15.</p> <p>Serves Determinations 3,4,5,7,8,9,11,12.</p> <p>Serves Determinations 2,6,11,13,15.</p>	<p>Correction of unsafe action must be made by the observer as it occurs.</p>

Activity: VII.A.	Function: IG	Position: N-H FCP1.	Page 7 of 8 Pages
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments
At option and convenience of officer, during or immediately after observation. (P) Activity observed is complex or unfamiliar. (P)	7. Records notes on observed performance, results, or on perceived attitudes and behavior.	Important observations are not later forgotten or distorted.	May use checklists or rating sheets prepared for observation.
Uncertainty of observation accuracy. (P) During process of observing, if such action does not interfere with a necessary completion of the performance that is being observed. (P-F) At discretion of the officer. (P)	8. Verifies observation, by means at discretion of the officer.  8.a. Asks individual to repeat his performance of the activity or a portion thereof. 8.b. Asks another individual to observe the activity, a portion thereof, or the result of the activity. 8.c. Asks the individual about what he did.	Certainty of observation is attained.	
At discretion of the officer. (P)  At discretion of the officer. (P)	9. Modifies plan of observation, depending upon the reasons for ineffective observation and other extenuating circumstances. 9.a. Asks individual to repeat his performance of the activity, or a portion thereof. 9.b. Selects another location from which to observe. 9.c. Selects another time to observe.	Desired information on manner of performance of job or job-training assignment is obtained, as time and situation permit.	
Desired evidence is not being obtained during the individual's performance. (M)			

Activity: VII.A.		Function: IG	Position: N-H FCPL,	Page 8 of 8 Pages
Indications Prior to Performance	Procedural Steps or Actions	Specific Determinations, Goals, or Standards	Precautions and Comments	
	9.d. Selects another method of observing. 9.e. Selects another individual to observe. 9.f. Selects another activity to observe. 9.g. Restudies pertinent directives for points to observe. 9.h. Reconsults with other persons on what or how to observe. 9.i. Selects a means other than observation for obtaining information on manner of performance.			

## **Appendix F**

### **TRAINING OBJECTIVE FOR TASK PROCEDURE PERFORMANCE**

#### **Training Objective for Activity II.P.**

The student is able to receive reports on, and compute results of, the gyro azimuth transmission check under normal job conditions. He must complete his portion of the check without sequence or action error, though with no special accuracy or speed requirements.

Normal job conditions implied for this performance are:

1. Availability of a qualified Computer Operator.
2. Availability of a Launching Control Console Operator.
3. Availability of at least one Launching Section Operator.
4. Inter-area cable communications operative.
5. No equipment malfunctions or operator errors.
6. No conflict with an operational mission requirement.
7. No conflict with an equipment repair being accomplished.

The procedure to be carried out by the student follows below in columnal form. The proper sequence and occasion for his actions are indicated in the first and second columns. Appropriate indicators of adequate performance of each step are contained in the third column.

When to Perform	Procedural Steps and Actions	What is Accomplished, and Indicators of Accomplishment
Standing in front of Battery Control Console.	1. Directs the Computer Operator to set up the AG transmission check for one Launching Section.	Communications are established with Launching Control Console Operator, verification is made that the manual portions of the gyro azimuth checks and adjustment procedures for a selected Launching Section have been completed and a launcher designated.
Prior to operator's setting of GYRO AZIMUTH 100's MILS switch, after computer is energized as indicated by illumination of ACTION indicator light.	2. Observes illumination of TARGET TRACKED indicator lamps.	Computer is energized, and conditioned for COMPUTER-TEST.  No target is being tracked, as indicated by illumination of IVORY instead of GREEN TARGET TRACKED lamp.
Prior to operator's setting of GYRO AZIMUTH 100's MILS switch, after computer is energized as indicated by illumination of ACTION indicator light.	3. Observes position of Computer CONDITION switch.	Computer is conditioned for test, as indicated by Computer CONDITION switch setting to STAND BY.
Computer Operator positions GYRO AZIMUTH 100's MILS switch to 20, and announces GYRO AZIMUTH dial reading (in mils).	4. Obtains GYRO AZIMUTH dial reading.	Reading is between 1995 and 2005 mils. when switch is set at 20, indicating the gyro azimuth being transmitted to Launching Section.
(Usual action)	4.a. Listens as Computer Operator announces the reading.	Reading obtained in mils.
(Optional action)	4.b. Observes reading on GYRO AZIMUTH dial.	Reading obtained in mils, interpolated from dial increments of 5 mils.
(Optional action)	4.c. Observes reading on GYRO AZIMUTH REPEATER dial.	Reading obtained in mils, interpolated from dial increments of 50 mils.

When to Perform	Procedural Steps and Actions	What is Accomplished, and Indicators of Accomplishment
Computer Operator announces Launcher heading (in mils).	5. Obtains Launcher heading or azimuth, from Computer Operator.	Heading obtained in mils.
Computer Operator obtains DATA CONVERTER dial reading (in mils) from Launching Section Operator, and announces it.	6. Obtains DATA CONVERTER dial reading from Computer Operator.	Reading obtained in mils.
AG, AL, and DATA CONVERTER dial readings known in mils for designated launcher.	7. Computes number of mils difference between transmitted and received gyro azimuth.	Difference is $\pm 25$ mils or less, indicating satisfactory reception by the Launching Section of the transmitted gyro azimuth.
(Usual action)	7.a. Subtracts the Launcher heading value from gyro azimuth reading, and compares the difference with DATA CONVERTER dial reading.  NOTE: When the gyro azimuth is less than the Launcher heading, adjusts the AG value by adding 6400 mils, before subtracting the AL value from it.	AG - AL = DATA CONVERTER dial reading within a tolerance of $\pm 25$ mils. (Step 4 - Step 5 = Step 6)
(Optional action)	7.b. Adds the Launcher heading value to the DATA CONVERTER dial reading, and compares the sum with the gyro azimuth reading.  NOTE: When the sum of AL and DATA CONVERTER dial reading is greater than 6400, adjusts the sum value by subtracting 6400 mils, and then compares with the AG.	AL + DATA CONVERTER dial reading = AG, within a tolerance of $\pm 25$ mils. (Step 5 + Step 6 = Step 4)
As desired for more complete check of other AG transmissions to same Launching Section.	8. Directs the Computer Operator to set the GYRO AZIMUTH 100's MILS switch to another position for same Launcher, obtains GYRO AZIMUTH dial reading, and (repeats Steps 5, 6, and 7).	Tolerance of $\pm 25$ mils is same for all AG transmissions to Launching Section.  Directed switch setting may be 4, 12, 28, 36, 52, or 60.

## **Appendix G**

### **TRAINING OBJECTIVE FOR USE OF TASK KNOWLEDGE**

#### **Training Objective for Activity 1.3.**

The student is able to recognize when to determine the authenticity of a voice communication.

Job conditions implied for this performance are:

1. Officer serving as the Battery Control Officer for the fire unit.
2. Voice communication received, or referred to him, from outside the fire unit.
3. Voice communication accomplished by radio, wire, or phone; not by face-to-face conversation.
4. Voice communication pertinent to, or occurring during, fire unit tactical operations.

Authentication will be initiated or challenged immediately upon receipt of:

1. Any instruction which, when implemented, would reduce or degrade the defense capability. Examples are:
  - a. Instructions reducing the State of Alert of the fire unit (expressed in terms of the period of time within which the unit must be capable of launching at least one missile).
  - b. Announcement of reduced DEFCONs. (Reference ARADCOM Reg. 525-1-4 for terms.)
  - c. Announcement of reduced Air Defense Warnings: (YELLOW or WHITE).
2. Special Weapons-Control instructions (CEASE FIRE or HOLD FIRE) when authenticity of the order is in doubt and time permits. Because of the need for rapid execution, normally rely on voice recognition and carry out the instructions, authenticating after the necessary action has been accomplished. (Reference ARADCOM Reg. 525-1-3, para. 16, for definition of terms and actions.)
3. Any order involving Weapons Control Cases. (Reference ARADCOM Reg. 525-1-5, para. 4, for terms.)
4. Any transmitter from a communicator whose authenticity or authority is doubtful or suspected. Such as:
  - a. Transmission by a strange voice of an order in conflict with prior directives.
  - b. Communicator, whose voice is not recognized, uses nonmilitary transmission format or phrases.
5. An incorrect authentication initiated by the transmitter (unless local SOP or SSI directs otherwise).



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11. SUPPLEMENTARY NOTES Systematic Analysis of Training Requirements and Procedures for Surface-to-Air Missile Battery Officers		12. SPONSORING MILITARY ACTIVITY Office, Chief of Research and Development Department of the Army Washington, D.C. 20310
13. ABSTRACT Research was undertaken to develop a systematic method that could be used by service school personnel to prepare job-oriented training objectives for junior officers, primarily in the form of behavioral statements of student performance expected after training. The procedures developed are divided into four phases: A--Listing of all tasks for a job; B--Selecting tasks for some formal training; C--Identifying the training emphasis needed in the selected tasks; D--Specifying the knowledges and skills necessary for the selected training aspects. The procedures included administration of experimental questionnaires, both by personal interview and by mail, reviews of pertinent directives and publications, and visits to field units. As the procedures were developed, they were tried out on a sample officer job (Nike Hercules Fire Control Platoon Leader). In the trial application, a task inventory of 452 items provided the basis for choosing, by use of definite selection rules, 101 job activities (22%) for some formal schooling; of 160 training objectives stated for these activities, 46 were performance-type objectives for which detailed activity descriptions were required. It is believed that use of these procedures by service school personnel to prepare junior officer training objectives is feasible, and that these procedures provide a method for deriving behavioral statements of relevant and essential objectives.		

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
SAMOFF Traini Objectives Behavioral Statements Job Analysis Junior Officer Personnel Military Training						
COSATI Field 5						

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